

Unit 1

Chemical Combination

Ionic bond	Covalent bond
It is a bond resulting from the electric attraction between a positive ion and a negative ion.	It is a bond occurred among the atoms of non-metals through the participation of each atom with the same number of electrons to complete the outer electron shell of each atom
metals	Non-metals
They are elements which have less than (4) electrons in the outermost energy level.	They are elements which have more than (4) electrons in the outermost energy level.
Solids - except (Mercury "Hg" is liquid).	Solids – gases – except (Bromine "Br" is liquid).
They have metallic luster	They have no luster
They are malleable and ductile	They are not malleable or ductile
They are good conductors of heat and electricity	They are bad conductors of heat and electricity – Except (Graphite "Carbon" is good conductor of electricity

Chemical Bonds

Positive ion	negative ion
It is an atom of metallic element that loses an electron or more during chemical reaction.	It is an atom of nonmetallic element that gains an electron or more during chemical reaction.
It carries positive charges equal to the number of the lost electrons.	It carries negative charges equal to the number of the gained electrons.
The number of its electrons is less than the number of protons inside the nucleus.	The number of its electrons is more than the number of protons inside the nucleus.
The number of energy levels is less than that of its atom.	The number of energy levels is equal to that of its atom.

Types of covalent bond:

1-Single covalent bond: It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with one electron.

2-Double covalent bond: It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with two electrons.

3-Triple covalent bond: It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with three electrons.

Ionic bond	Covalent bond
- Formed due to: Electrical attraction Between two different elements (metal "positive ion"- nonmetal "negative ion") to form compound.	- Formed due to: sharing of one pair of electrons or more Between: two similar nonmetal atoms to form: molecule. two different nonmetal atoms to form: compound.

Chemical Combination

Valency: It is the number of electrons that atom loses, gains or shares during a chemical reaction.

Valency of Metals		
Monovalent	Divalent	Trivalent
- Lithium (Li) - Sodium (Na) - Potassium (K) - Silver (Ag)	- Mercury (Hg) - Magnesium (Mg) - Calcium (Ca) - Lead (Pb)	- Aluminum (Al) - Gold (Au)

- Copper (Cu): Monovalent - Divalent
 - Iron (Fe): - Divalent (Ferrous) - Trivalent (Ferric)

Valency of Nonmetals			
Monovalent	Divalent	Trivalent	Tetravalent
- Hydrogen (H) - Chlorine (Cl) - Bromine (Br) - Iodine (I) - Fluorine (F)	- Oxygen (O)	- Nitrogen (N) - Phosphorus (P)	- Carbon (C)

- **Sulphur (S):** Divalent – Tetravalent – Hexavalent
 - Nitrogen (N) – Phosphorus (P): Trivalent

Atomic group: set of atoms (of different elements) joined together behave like (1) atom during chemical reaction.

Monovalent	Divalent	Trivalent
<ul style="list-style-type: none"> - Hydroxide (OH) - Nitrate (NO₃) - Nitrite (NO₂) - Ammonium (NH₄) - Bicarbonate (HCO₃) 	<ul style="list-style-type: none"> - Carbonate (CO₃) - Sulphate (SO₄) 	<ul style="list-style-type: none"> - Phosphate (PO₄)

Chemical formula: It is a formula that represents the number and types of atoms in a molecule.

Compound	Chemical formula	Compound	Chemical formula	Compound	Chemical formula
Sodium Chloride	NaCl	Aluminium Sulphate	Al ₂ (SO ₄) ₃	Magnesium Hydroxide	Mg(OH) ₂
Sodium Nitrate	NaNO ₃	Aluminium Carbonate	Al ₂ (CO ₃) ₃	Magnesium Sulphate	MgSO ₄
Sodium sulphate	Na ₂ SO ₄	Aluminum Oxide	Al ₂ O ₃	Hydrogen Chloride	HCl
Sodium Hydroxide	NaOH	Water	H ₂ O	Calcium Carbonate	CaCO ₃
Sodium Carbonate	Na ₂ CO ₃	Copper Carbonate	CuCO ₃	Calcium Sulphate	CaSO ₄
Sodium Oxide	Na ₂ O	Carbon Dioxide	CO ₂	Calcium Oxide	CaO

Acids	Bases
They are substances which dissolve in water producing positive hydrogen ions (H) ⁺ .	They are substances which dissolve in water producing negative hydroxide ions (OH) ⁻ .
The symbol of acids begins with H.	The symbol of alkalis ends with OH.
They have sour taste .	They have bitter taste .
They change color of litmus paper into red: Due to presence of hydrogen ions (H) ⁺ .	They change color of litmus paper into blue: Due to presence of hydroxide ions (OH) ⁻ .
Ex: Hydrochloric acid (HCl) – Sulphuric acid (H ₂ SO ₄)	Ex: Sodium Hydroxide (NaOH) -

Types of Compounds:

Oxides: They are compounds resulted from combination between oxygen and element which is metal or non-metal.

Metal oxides	Non-metal oxide
Formed from combination of oxygen with metal.	Formed from combination of oxygen with nonmetal.
Sodium oxide (Na ₂ O) - Calcium Oxide (CaO) – (Al ₂ O ₃).	Carbon dioxide (CO ₂) – Sulphur trioxide (SO ₃).

Salts:

Compounds resulted from combination of positive ion (or atomic group) with negative atomic group (or ion except (O₂)).

Mineral salts:

Salts dissolved (soluble) in water		Salts undissolved (insoluble) in water
Sodium chloride (NaCl)	Sodium sulphide (Na ₂ S)	Silver chloride (AgCl)
Potassium sulphate (K ₂ SO ₄)	Calcium nitrate [Ca(NO ₃) ₂]	Lead iodide (PbI ₂)
Magnesium carbonate (MgCO ₃)		Lead sulphate (PbSO ₄)

Chemical Reaction

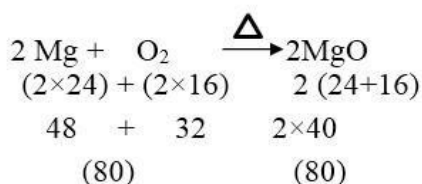
Process involves breaking the bonds in the reactant molecules and forming new bonds in the products.

* Chemical Equation:

Set of symbols and chemical formulae representing the reactants and products molecules in the chemical reaction and it represents the conditions of the reaction.

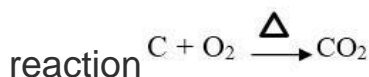
• **G.R *Chemical Equation must be balanced:**

number of atoms entering reaction = number of atoms resulting from



(atomic mass of Mg = 24, O = 16)

(Ratio between Mg = $\frac{24}{16}$ & O = $\frac{3}{2}$)



* Law of constant ratios:

Chemical compound is formed from combination of its elements by constant weight ratios.

* Types of chemical reactions:

* Direct combination reactions:

Reactions which involve a combination of two substances to form a new compound.

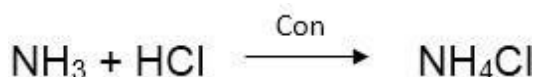
- 1- Combination of an element with another element.
- 2- Combination of a compound with a compound. □
- 3- Combination of an element with a compound.

Combination of an element with another element:

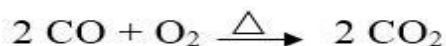
Combination of two nonmetal elements	Combination of a metal with a nonmetal
<p>* Carbon joins Oxygen forming Carbon dioxide:</p> $\text{C} + \text{O}_2 \xrightarrow{\Delta} \text{CO}_2$	<p>* Magnesium joins Oxygen forming Magnesium dioxide.</p> $2 \text{ Mg} + \text{O}_2 \xrightarrow{\Delta} 2 \text{ MgO}$
<p>* Hydrogen joins Chlorine forming Hydrogen chloride:</p> $\text{H}_2 + \text{Cl}_2 \longrightarrow 2 \text{ HCl}$	

• **2- Combination of a compound with a compound:**

- Ammonia joins Hydrochloric acid forming ammonium chloride: rod wet with ammonia placed close to tube contains concentrated hydrochloric acid- white fumes (cloud) of ammonia chloride are formed.



- **3- Combination of an element with a compound:**
- * Carbon dioxide (compound) reacts with Oxygen (element) producing carbon dioxide:



- * Nitrogen monoxide (compound) reacts with Oxygen (element) producing Nitrogen dioxide:



• * **Chemical reaction in our life**

- * **importance of Chemical reaction**: used in industries as: Medicines – Fertilizer – Fuel – Plastics.
-
- * **Negative – bad effects of Chemical reaction**:
- **1- Fuel burning**: producing:
- **A- Carbon dioxide (CO₂)**: acts as green house: as it allow pass of sunrays to earth and never let them return back.
- **B- Carbon monoxide (CO)**:
- **Causes**: Headache – Fainting – Sever stomach aches and may lead to death.
- **2- Sulphur oxides: [Sulphur dioxide (SO₂) - Sulphur trioxide (SO₃)]**
- They are acidic gases causes: Respiratory system problems – Building corrosion.
- **3- Nitrogen dioxides: [Nitric oxide (NO) – Nitrogen dioxide (NO₂)]:** resulted at the time of lightning.
- They are: acidic gases – Poisonous – Affect the nervous system and the eye.
- **4- Burning of Coal and Cellulose fibers:**
- as paper – Cigarettes cause air pollution and lung cancer.

Unit 2 lesson 1

Force:

It's an effect attempts to change the object's phase from being static to motion or vice versa or attempts to change the direction of motion.

Measuring unit of force: **Newton.**

Universal Forces in Nature:

Attraction force: between Earth and objects.

- Earth attracts objects to its center by force called "Object's weight" which increases by increase of the object's mass

Object's weight:

ability of earth to attract that object to its center. Or: It's the force of Earth's gravity on the object.

Object's center of gravity: It's point at the center of object at which the force of gravity affects the object.

Object's weight (W) = Object's mass (m) × Earth's gravity acceleration (g)

Newton

Kg

10 m/s²

1- **Electromagnet:**

It changes the electric energy into magnetic energy.

Uses of Electromagnet:

electric bells – electric winches (used in lifting scrap iron and cars).

2- **Electric generator (Dynamo):** It changes the mechanical energy into electric energy.

3- **Electric motor:** It converts the electric energy into mechanical energy.
(motor in fan- blinder- washing machine).

Strong Nuclear forces: used in: Producing electricity - Military purposes (wars)

Weak Nuclear forces: used in: Medicine – Scientific researches – Industry.

Lesson 2

Inertia:

It's a property of object has to resist the change of its phase unless an external force acted on it.

Passengers are rushed back when the car move suddenly

Passengers are rushed forward: when the car stop suddenly

Coin falls inside the cup: due to its inertia force

Inertia makes object resist the change of its rest or motion state. □

Technological application on Inertia:

G.R Using safety belts in cars:

to stop inertia to keep passengers safe

➤ Friction force: It's resistant force originate between the object in motion and the medium touching it.

Benefit of Friction force: prevent slipping – help in car motion or stopping – help in match burn

Harms of Friction force: make machine erosion – great loss in mechanical energy – decrease performance of machines

Lesson 3

➤ **Motion**: It's the change in position in space as time passes.

Relative motion: the change in object's position as time passes relative to another object or fixed point.

Application	Observation
Two cars move in the same direction with the same speed	Two cars stop moving
Two cars in the same direction but one is faster	The other car moves back(in opposite direction)
Two cars moves in an opposite direction and one of them faster	The other car moves with high speed

Types of Motion:

1. **Transitional motion**:

It's motion in which object's position is changed relative to a fixed point from initial to final position as time passes.

Ex: Person – Car - Train

G.R: Transitional motion is a relative motion:

B. it's change of an object's position as time passes relative to another object.

2. **Periodic motion**:

It's the motion which is regularly repeated in equal periods of time.

Ex: Vibrating motion (simple pendulum) – **Circular motion** (fan arms) –

Wave motion (stone in water).

1. Wave motion:

Mechanical waves	Electromagnetic waves
Produced by vibration of medium particles	Accompanied by electromagnetic forces
Need a medium to transfer through	Spread in all media and free space
Speed is relatively low (sound speed 340m/s)	Speed is very high (light speed is 300 million m/s)
Ex: Sound waves – water waves	Light waves – X-rays – Radio waves – Ultra violet – Infra red

Lightning and Thunder

- **G.R:** We see Lightning before hearing thunder:

As Light speed is greater than sound speed

G.R- We receive sunlight but don't hear solar explosions:

B. Light travel through space but the sound need medium.

Technological applications of mechanical waves:

1- Used in examining and curing sets for human body

(Ultrasonic waves – Sonar).

2- Musical instruments:

a – **Stringed musical instruments:** Violin – Lute – Guitar. b –

b- **Pneumatic musical instruments:** Flute – Reed pipe.

3- Amplifiers an distributing sets.

Technological applications of electromagnetic waves:

Electromagnetic waves	Application
Ultra violet rays	Sterilize surgical operation rooms: Becu. they've property of killing microbes
X rays	<ul style="list-style-type: none"> - Photographing bones to detect bones fractures - Examining mineral raws and showing errors, pores and cracks.
Gamma rays	In medical purposes: to treat and discovering some swellings
Visible light	Used in: Photographic cameras – Television cameras – Data show.
Infra red rays	Used in: Night vision - Remote sets – Cooking food: Becu. they've heat effect

Unit 3

Stars: They're big-sized bodies emit enormous amount of heat and light.

G.R: Stars appear small although they're big-sized:

Bec. they are very far away from us. □

Light year: It's the distance covered by light in one year and it = 9.467×10^{12} km.

$D \text{ in km} = d \text{ in light year} \times 9.467 \times 10^{12}$

$D \text{ in light year} = d \text{ in km} \div 9.467 \times 10^{12}$

Galaxies: Big units form universe.

Our Galaxy is: The milky way galaxy.

Telescopes: Identify the celestial bodies.

The kinds of telescopes: Reflecting – Refracting.

The Solar System: consists of.

The Sun:

1. It's the star of our solar
2. Biggest body in our Solar
3. Lies the center of solar.

The Eight Planets: Spherical opaque bodies revolve around sun in (oval) paths

<u>Inner Planets</u>	<u>Outer Planets</u>
Mercury – Venus – Earth – Mars	Jupiter – Saturn – Uranus – Neptune
Small in size	Big
High density: As they consist of solid bodies.	Low density: As they consist of gaseous elements.
Have a <u>few</u> number of moons	Have <u>large</u> number of moons
Their gravitational is small.	Their gravitational is large.

All planets have Atmosphere: except Mercury.

All planets have moons: except Mercury and Venus.

Outer planets consist of: Helium and Hydrogen as solidified gases

Isaac Newton: discovered Earth's Gravity.

Gravity depend on:

1- The mass of each object. 2- The distance between them.

Jupiter has largest gravity

Mars has smallest gravity

Earth has largest gravity in inner planets – largest mass and density

Moons: They're small planets revolve around planets.

Asteroids: They're rocky celestial bodies that revolve the sun in the region of the wanderer asteroids.

The asteroids belt: It's a region separates inner planets from outer planets.

Meteors: luminous arrows that can be seen in the sky due to completely burning in earth's atmosphere.

Meteorites: The remaining part of the rocky masses without burning that falls on the earth's surface.

Comets: They're masses of (rocks, ice and solidified gases) that revolve around the sun in more elongated oval paths. It consist of: head – tail.

Most famous Comet "Halley" takes 76 years around sun.

The sun occupies the centre of the solar system.

The distance between earth& sun is about 150 million Kms

The earth is the third planet regarding the distance from the sun, while it is the fourth order regarding to volume

Lesson 2

Q. Describe the shape of the earth at the poles& equator:

The Earth is a spherical object and has slight

flat at two poles and indented at equator

The tropical radius is about 22 Km larger than the polar radius.

Earth is the biggest mass (planet) in the inner planets

G.R Concerning the volume, the Earth occupies the fourth order.

Bec. **Earth** is bigger than the inner planets

1) Atmosphere: A mixture of gases that surround the Earth

G.R The presence of a white colour surrounds the planet Earth.

B. Earth surrounded by atmosphere

Importance of atmosphere:

1. Keep temperature suitable to Earth
2. It has ozone layer which protect us from harmful sunrays
3. It helps in burning of meteors and meteorites
4. All weather phenomena (wind-rains) occurs in it
5. It has important gases as ($O_2 - N_2 - CO_2$)

G.R The great extension of atmosphere in space is important for Earth's life

Because, it helps in complete burning of meteors and decrease speed of meteorites

2) Earth's hydrosphere

Water represents 71% of the Earth surface

The salty water represents 97% , while the fresh water is about 3%

Ground water exists in the pores and cracks of rocks

Importance of water

1. Plant use it in photosynthesis process
2. Keep body temperature constant
3. It form blood and help in digestion process
4. Keep temperature suitable for man
5. 50% of organisms live in water

G.R Temperature on Earth's surface suits the life of living organisms.

Becu. Earth is in third order far from the sun makes temperature suitable for life

G.R Steadfastness of the hydrosphere on the Earth surface

OR Keeping the Earth surrounded with the atmosphere

OR Constancy and Steadfastness of objects and organisms on Earth's surface

Because, Earth has a force of gravity

G.R The planet Earth is suitable for life.

Because, it has water, gravity, atmosphere, suitable temperature and atmospheric pressure

The suitable atmospheric pressure is about 76 Cm Hg. □

Q. Write the importance of:

Carbon dioxide gas. It is used in photosynthesis process.

Ozone layer. It is used to protect us from the harmful ultraviolet rays.

Oxygen. It is used in respiration process and burning process.

Nitrogen gas. It is used in forming proteins

Hydrosphere. It is used drinking, washing and food digestion.

G.R The inner part of Earth was a molten form

Due to high temperature

Q. How the Earth layers formed ?

Heavy metals have more density (iron and nickel) move towards Earth center while lighter components have low density move upward

* **The layers of the earth** are crust, mantle & core.

The crust The light outer layer of the earth. **Thickness** 8 – 60 km

The mantle The middle rocky layer of the earth that lies between crust & core

Thickness 2885 km

The core The inner layer of the earth.

Outer core	Inner core
1. It is a layer of molten metals. 2. It's thickness is about 2100 Km.	1. It is a solid layer rich in iron and nickel. 2. It's thickness is about 1350 Km.

Lesson 3

➤ Rocks

A natural solid material exists in the earth's crust & is formed of a group of minerals.

Types of rocks

1- Igneous rocks. 2- Sedimentary rocks. 3- Metamorphic rocks.

First: Igneous rocks:

Rocks Formed from the molten matter (magma or lava).

Examples: Granite. - Basalt.

P.O.C	Plutonic igneous rocks	Volcanic igneous rocks
Size of crystals	Large	Small
Texture	Coarse – rough	smooth
Holes	Absent	Present
Ex.	Granite	basalt
P.O.C	Granite rock	Basalt rock
Kind	Plutonic igneous rocks	Volcanic igneous rocks
Colour	Pink or grey	Dark
Components	Can be see by eye	Cannot be see by eye
Minerals forming them	Quartz – feldspar – mica	Olivine – feldspar – pyroxene
Found in	Sinai	El Fayoum

Second: Sedimentary rocks.

They are rocks which are formed from the fragments & decomposed of other rocks.

The formation of sedimentary rocks:

By 3 steps: Erosion. - Transportation. - Sedimentation.

Examples Sandstones. - Limestone.

P.O.C	Sandstones	Limestone
Colour	Yellow	White
Texture	Coarse – rough	smooth
Minerals forming them	Quartz – feldspar – mica	Mineral calcite
Reaction with dil. Hydrochloric acid (HCl)	No reaction	It makes effervescence due to CO ₂ gas evolved

Third: Metamorphic rocks.

The rocks formed from igneous or sedimentary rocks under **high temperature or pressure** .

Example

Such as: **Marble** (produced from conversion of **limestone**)

Final Revision**① Choose the correct answers:**

1. The molecules of Nobel gases consist of atom
 - a. Two similar atoms.
 - b. Two different atoms.
 - c. One atom.
 - d. Three atoms.
2. The covalent bond usually arises between elements
 - a. Two metallic.
 - b. Two non-metallic.
 - c. Metallic and non-metallic.
 - d. Nobel and non-metallic.
3. There are triple covalent bond in molecules
 - a. Hydrogen.
 - b. Chlorine.
 - c. Oxygen.
 - d. Nitrogen.
4. All the following metals share in chemical reaction except
 - a. Sodium ($_{11}\text{Na}$).
 - b. Neon ($_{10}\text{Ne}$).
 - c. Hydrogen ($_{1}\text{H}$).
 - d. Nitrogen ($_{7}\text{N}$).
5. When Nitrogen atom ($_{7}^{14}\text{N}$) gains electrons to complete its outer shell, It becomes
 - a. N^{+3}
 - b. N^{-2}
 - c. N^{-1}
 - d. N^{-3}
6. All the following elements are monovalent except
 - a) Hydrogen
 - b) Sodium
 - c) Oxygen
 - d) Chlorine
7. The chemical formula of Calcium carbonate is
 - a. CaO
 - b. $\text{Ca}(\text{NO}_3)$
 - c. CaCO_3
 - d. $\text{Ca}(\text{HCO}_3)_2$
8. The salt that is formed on combination of positive atomic group with negative atomic group is
 - a) NH_4Cl
 - b) $(\text{NH}_4)_2\text{CO}_3$
 - c) Na_2SO_4
 - d) NH_4Br
9. When base dissolves in water, It givesions.
 - a) H^{+}
 - b) H^{-}
 - c) OH^{+}
 - d) OH^{-}
10. All the following turn the blue litmus paper into red except.....
 - a) HCl
 - b) HNO_3
 - c) NaOH
 - d) H_2SO_4
11. The bright magnesium ribbon changes into white powder of when it burns in air.
 - a) Magnesium nitrite
 - b) Magnesium Oxide
 - c) Magnesium hydroxide
 - d) Magnesium dioxide

a. gravitational force
b. friction force
c. nuclear force
d. inertia force

a. Object weight b. inertia c. friction force d. gravity

a. Moving b. static c. moving and static

A. iron b. oxygen c. sodium

a. 118 b. 113 c. 92 d. 20

a) Mercury b. nitrogen c. magnesium d. chlorine

a) gains electrons b. Charge of nucleus change
c. number of energy levels increases. d. loses electrons

a. less than b. more than c. equal

a. covalent b. single covalent c. double covalent

a. Hydrogen b. Nitrogen c. Oxygen d. water

a. zero b. mono c. di d. Tri

a. Co_3 b. Co c. HCo_3 d. Tri

24..... salt dissolves in water.

- a. K_2SO_4 b. $CuCO_3$ c) $PbSO_4$

25. The combination between ammonia and hydrochloric acid form of ammonium chloride.

- a. white ppt. b. white powder c. white fumes d. white solution

26. From forces enable living organisms to do biological operation is

- a. pulse b. Friction c. inertia force

27. From accompanied force due to the motion are

- a. force of inertia b. friction force c. all the previous

28. When car move forward suddenly the passenger rushed

- a. forward b. back word c. upright

29. From application on force of inertia is

- a. safety belts b. car's break c. car tires

30. The water transports from soil to plants leaves by effect of force.

- a. gravity b. biological c. inertia d. friction

31. The parts of machines must be lubricated to

- a. increase friction b. increase temperature
c. decrease friction d. reduce inertia

32. The weight of object changes by

- a. changing its speed b. changing its mass
c. it's distance from earth surface d. b and c

33. The isolated coil in electromagnet is made up from

- a. iron b. magnet c. copper

34. The objects fall down by the effect of

- a. electromagnet force b. gravitational force
- c. nuclear force d. magnetic force

35. Mass x Earth's gravity acceleration equal

- a. volume b. weight c. density

36. If you are in a moving train, you imagine that the cars moving in the same direction on the road with same speed

- a. Stop b. move forward
- c. move backward d. move with a high speed

37. when two cars move in same direction with velocity 80 km/h, the driver of the first car imagines that the second car moves with velocitykm/h

- a. zero b. 80 c. 160 d. No correct answer

38. The motion of train is

- a. periodic motion b. vibrating motion
- c. wave motion d. transitional motion

39. The speed of light wave in space than speed of radio waves.

- a. less b. higher c. equal

40. The distance covered by light in a year = km

- a. 150 million b. 9.467×10^{12}
- c. 6368 d. 5.9×10^{24}

41. layer is rich of Iron and nickel.

- a. inner core b. crust c. outer core d. mental

42. is an example of volcanic rocks.

- a. Granit b. marble c. Basalt d. Quartz.

43.is yellow in color and has a coarse texture

- a. Granit b. Marble c. Basalt d. Sandstone

44. is produced from conversion of lime stone.

- a. Granite b. Marble c. Basalt d. Sandstone

② Complete the following :-

1- is the only liquid metal element, while is the only liquid non-metals.

2- During dissolving in water acids give ion , while bases give ion

3- The bond in Hydrogen molecules is abond, while the bond in Nitrogen molecules is aand in Oxygen molecule is bond

4- The types of covalent bonds are , and

5- During the formation of sodium chloride (NaCl) molecules atom loses electrons which are gained by atom.

6- Acids turns litmus paper to red due toion ,While bases turn litmus paper to blue due to ion.

7- Some metallic elements have more than one valency as..... and

8-Acids have taste and change the colour of litmus paper to

9- Compound are classified into ,..... ,..... and

10- The valency of iron in ferrous chloride is while in ferric chloride is

11- is an example of soluble salt , While is an example of insoluble salt

12- Earth attracts the object to its by the force known as the object's

- 13- The measuring unit of object's mass is , while the measuring unit of object's weight is
- 14- Electromagnet is used in making and
- 15-The Earth's inner core consistsandin a solid state
16. The igneous rocks are divided according to the site of the formation in the Earth's surface into.....rocks&.....rocks
17. The igneous rocks are formed of molten material underneath the Earth's crust which is called
18. The sequence of sedimentary rocks formation is....., and
- 19.The metamorphic rock are produced as a result of the effect of heat and pressure on the and rocks
- 20- Types of motion are and
- 17-is an effect attempts to change object phase from static to motion or vice versa or change motion direction
- 21- During chemical reaction, sodium atom tends to one electron and changes into
- 22- The bond in nitrogen molecule is while that of magnesium oxide is....
- 23- Granite is an example of rocks, while Is an example of sedimentary rocks
- 24- The outer level in calcium ion has electrons
- 25- $\text{NH}_3 + \dots \xrightarrow{\text{Conc.}} \text{NH}_4\text{Cl}$, The type of this reaction is

3 Write the scientific term

1- It is an atom that loses (gives) one electron or more during the chemical reaction	(.....)
2-- It is an atom that gains one electron or more during the chemical reaction	(.....)
3- It is an atom that loses or gains one electron or more during the chemical reaction	(.....)
4- It is an atom that doesn't loses or gains one electron or more during the chemical reaction	(.....)
5- A bond between metal (positive ion) and non-	(.....)

metal (negative ion)	
6- Bond between two nonmetals each atom share with the same number of electrons	(.....)
7- The numbers of electrons that gained or lost by atom during the chemical reaction	(.....)
8-A natural solid material exists in the earth's crust& is formed of a group of minerals.	(.....)
9- Formula that represents number and type of atom in the molecules	(.....)
10- Substance that dissociate in water forming positive hydrogen ions	(.....)
11- Substance that dissociate in water forming negative hydroxide ions	(.....)
12- Substance that formed by combination between elements and oxygen.	(.....)
13- Breaking down bond between reactants and formation a new bond between products	(.....)
14- A set of symbols and chemical formula that represents reactants , products and conditions of reaction	(.....)
15- Chemical compound formed by combination between its elements by constant ratios	(.....)
16- Mass of reactants equal to mass of products	(.....)
17- Chemical reaction between two substances to form a new substance	(.....)
18. The measuring unit of the weight.	(.....)
19.The measuring unit of the mass.	(.....)
20- The change in an object position or direction with the time passes relative to frame of reference	(.....)
21. The type of rocks which are formed from the molten matter underneath the earth's crust. (.....)	(.....)
22. The type of igneous rocks which are formed when magma reaches earth's surface in the form of a flow of lava.	(.....)

(.....)	
23. The type of rocks which are formed when other rocks are exposed to high pressure & temperature.	(.....)

4 Write the chemical equation

1- Carbon burning in the presence of oxygen.

.....

2- Hydrochloric acid is combined with ammonia gas.

.....

3- The reaction between carbon monoxide with oxygen.

.....

4- Burning magnesium ribbon in the presence of oxygen.

.....

5- Hydrogen with chlorine.

.....

5 Write the chemical formula of the following:

The Compound	Chemical formula
1. Sodium Chloride	
2. Sodium nitrate	
3. Sodium Carbonate	
4. Sodium Hydroxide (Caustic soda)	
5. Calcium Chloride	
6. Calcium Nitrate	
7. Potassium Carbonate.	
8. Calcium Sulphate.	
9. Calcium Hydroxide (Lime water)	
10. Copper Carbonate	
11. Aluminum Carbonate	
12. Aluminum Sulphate.	

6 Give reason for

- 1- Acids turns litmus paper into red while bases change litmus paper to blue
- 2- Potassium 19K is monovalent while 8O is divalent.
- 3- An oxygen atom joins two atoms of sodium when composing one molecule of sodium oxide.
- 4- White clouds are formed when hydrochloric acid reacts with ammonia gas
- 5- A chemical equation should be balance.
- 6- When an atom loses electrons changes into positive ion.
- 7- The bond in oxygen molecule is a double covalent bond.
- 8- The car passengers are rushed forward when the car stopped suddenly
- 9- Fan still working for few seconds after cutting electricity
- 10-Policemen advice drivers to wear safety belts
- 11- Weight of an object change from place to another on earth.
- 12- Effervescence takes place when hydrochloric acid is added to a sample of limestone.
- 13- When you push a wall, it doesn't move
- 14-Heart muscle contracts and relaxes regularly.
- 15-Car tires are covered with a very coarse substance.
- 16-The Earth's inner core is rich in iron and nickel.
- 17- The crystals of minerals that form the plutonic rocks are large-sized
- 18-Both aluminum ion and nitrogen ion have the same number of electrons
- 19-The bond in hydrogen molecule is a single covalent bond.
- 20-Sodium is monovalent, while calcium is divalent.
- 21-Aluminium oxide molecule is composed of two aluminum atoms and three oxygen atoms.
- 22-On burning a magnesium ribbon in air, a white powder is formed.

7 What happen when..?

1- Approaching a wet rod with hydrochloric acid to ammonia gas

.....

2- When an electric current passes through an insulated – copper wire coiling around a bar of soft iron

.....

3- Don't use the safety belts in cars

.....

4- When driver stop suddenly to cars passengers

.....

8 Put (✓) or (x) and correct the wrong ones:

1- All non-metals are bad conductor of electricity except graphite ()

2- Lithium ion has one positive charge ()

3- All non-metals are solid except mercury ()

4- The bond in oxygen molecule is triple covalent ()

5- In ionic bond is formed due to attraction between positive and negative ions ()

6- Water molecule consists of 2 atoms of two elements ()

7- The chemical formula of nitric acid is HNO₃ ()

8- Sodium hydroxide is base but magnesium carbonate is oxide ()

9- The motion of simple pendulum is a transitional motion ()

10- Potassium sulphate salt is dissolve in water ()

11- The burning of carbon in presence of oxygen is direct combination

12-The weight of NO₂ is higher than weight of NO ()

13-Oxygen reacts with carbon and carbon monoxide forming CO₂ ()

14-The force effects on the direction of motion ()

15-Electric current has magnetic effects ()

16-The wire of electro magnet made up of copper ()

17-The relative speed of car move beside your car with same speed is very high ()

10 Compare between the following :

- 1- Acid and base
- 2- Positive ion and negative ion
- 3- Ionic bond and covalent bond

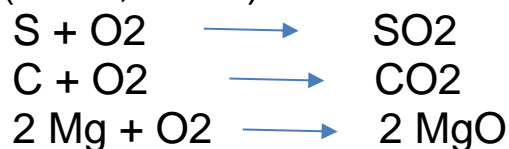
12- Identify which type of the following compound and its name

KCl - NaOH - HCl - NO - K₂SO₄ - PbI₂ - KOH - NH₄Cl - CO₂ - H₂SO₄

- 13- Calculate the mass of an object weight's 10 Newton
(Earth gravity=9.8 m/s²)
-
-

- 14- Calculate the weight of an object its mass 10 k.g
(Earth gravity=9.8 m/s²)
-
-

- 15- Calculate the masses of reactants and products in the following reactions:
Knowing that the mass of (S= 32 gm, O = 16 gm, Mg= 24 and C= 12)
(C=12, O=16)

**16-Give one example for:**

1. A circular motion
2. Transitional motion
3. Vibrating motion
4. Wave motion
5. Mechanical wave
6. Electromagnetic wave
- 7- Periodic motion

Model answers**① Choose the correct answers:**

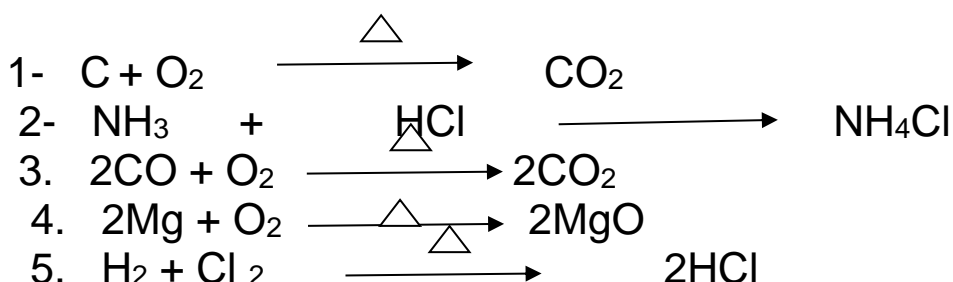
1. c	2. b	3. d	4. b	5. d	6. c	7. c	8. b	9. d	10. c
11. b	12. b	13. c	14. c	15. b	16. a	17. c	18. d	19. a	20. b
21. b	22. a	23. a	24. a	25. c	26. a	27. c	28. b	29. a	30. b
31. c	32. d	33. b	34. b	35. b	36. a	37. a	38. d	39. c	40. b
41. a	42. c	43. d	44. b						

② Complete the following:-

1. Mercury –bromine	14- Winch – electric bell
2- H^+ , OH^-	15-iron – nickel
3. Single covalent – triple covalent , double covalent	16- plutonic – volcanic
4. Single-double-triple	17- plutonic
5-sodium -1 electron – chlorine	18- erosion- transportation- sedimentation
6- H^+ - negative hydroxide	19- igneous- sedimentary
7-copper- iron	20- transitional – periodic
8- sour – red	21-lose- positive
9- acid- base – oxides – salts	22-triple covalent – ionic
10-di valent – trivalent	23-igneous- sand stones
11- potassium sulphate- Lead sulphate: $PbSO_4$	24-8
12- center – weight	25-HCl
13-Kg – Newton	

3 Write the scientific term

1. positive ion	9. chemical formula	17. direct chemical reaction
2. negative ion	10. acids	18. newton
3. ion	11. bases	19. gm or kg
4. Nobel gases	12. oxides	20. motion
5. ionic bond	13. chemical reaction	21. igneous rocks
6. covalent bond	14. chemical equation	22. volcanic rocks
7. Valency	15. law of constant ratio	23. metamorphic rocks
8. rocks	16. law of conservation of matter	

4 Write the chemical equation.**5 Write the chemical formula of the following:**

1. NaCl 2. NaNO₃ 3. Na₂CO₃ 4. NaOH 5. CaCl₂
 6. Ca(NO₃)₂ 7. K₂CO₃ 8. CaSO₄ 9. Ca(OH)₂ 10. CuCO₃
 11. Al₂(CO₃)₃ 12. Al₂(SO₄)₃

Give reason for

- Because acids has positive hydrogen ions while bases have negative hydroxide ions
- Because potassium losses one electron while oxygen gains 2 electrons.

3. Because sodium is monovalent while oxygen is divalent
4. Due to formation of ammonium chloride
5. To achieve law of constant mass
6. Because number of positive protons is more than number of negative electrons
7. Because each atom share with two electrons
8. Due to the force of inertia
9. Due to the force of inertia
10. To stop effect of inertia force when stop suddenly
11. Due to change earth's gravity acceleration
12. Due to formation of ammonium chloride
13. Because the force is improper
14. To deliver the blood to all body cells
15. To decrease the friction force
16. Because they are heavy metals.
17. Because the magma cooled slowly, and take large time to be formed.
18. Because when aluminum loses 3 electron the number of electrons become 10, while nitrogen gains 3 electrons.
19. Because each of hydrogen atoms share with 1 electron.
20. As sodium loses one electron to complete the outer most energy level, while calcium gains 2 electrons.
21. Because aluminum is trivalent
22. Due to formation of magnesium oxide substance.

7 What happen when..?

1. White fumes of ammonium chloride are produced.
2. The iron will be a magnet called electromagnet
3. The driver get harmed when he stop suddenly
4. The passengers will rushed forward

8 Put (✓) or (x) and correct the wrong ones:

1.true	2. true	3. false	4. false	5. true	6.false	7. true	8. false	9. false
10. true	11. true	12. true	13. true	14. true	15.true	16.true	false	

12- Identify which type of the following compound and its name

Salt – base – acid – oxide – salt – salt – base – salt – oxide – ACID

13- Calculate

Mass = weight / gravity

$$= 10 / 9.8 = 1 \text{ kg}$$

14. Weight = mass x gravity

$$10 \times 9.8 = 98 \text{ N}$$

Knowing that the mass of (S= 32 gm, O = 16 gm, Mg= 24 and C= 12)
(C=12, O=16)



Mass of reactants = $32 + 2 \times 16 = 64 \text{ gm}$

Mass of products = $32 + 2 \times 16 = 64 \text{ gm}$



Mass of reactants = $12 + 2 \times 16$

Mass of products = $12 + 2 \times 16$



Mass of reactants = $2(24) + 2 \times 16 = 80 \text{ gm}$

Mass of products = $2(24 + 16) = 80 \text{ gm}$.

-Give one example for:

1. Moon rotation around earth

2. Train

3. Simple pendulum

4. Water wave

5. sound wave

6. Light wave

7- circular or wave motion



Final Revision

Mr. Ahmed Elbasha

★ **(1) Write the scientific term:**

- 1) A set of atoms joined together behave like one atom only, having a special valence and it can't be existed solely (.....)
- 2) The motion which is regularly repeated in equal periods of time. (.....)
- 3) Breaking the reactants bonds and forming new ones among the products (.....)
- 4) The ability of the Earth to attract an object to its center. (.....)
- 5) Elements have luster, good conductors of heat and electricity, malleable and ductile and they contain 1, 2 or 3 electrons in their outer electron shells. (.....)
- 6) It's a layer of molten metals with a thickness 2100 km. (.....)
- 7) The waves which are produced by the vibration of medium particles (.....)
- 8) Compounds produced as a result of the combination of a positive ion with a negative ion except oxygen (.....)
- 9) Oxides which help in building corrosion. (.....)
- 10) Resistant forces originate between the object in motion and the medium. (.....)
- 11) The only nonmetal that exists in a liquid state. (.....)
- 12) A set of symbols and chemical formulae representing reactants and products molecules in chemical reaction (.....)
- 13) The product of multiplying object's mass by Earth's gravity acceleration. (.....)

- 14) The number of electrons gained, lost or even shared during a chemical reaction (.....)
- 15) It is an effect that attempts to change state of object from static to motion or vice versa. (.....)
- 16) The layer of atmosphere which protects us from ultraviolet rays (.....)
- 17) Type of chemical bonds arises due to electric attraction between positive ion and negative ion (.....)
- 18) Compounds that dissolve in water producing positive hydrogen ions H^+ (.....)
- 19) An atom of an element does not give or gain any electrons (.....)
- 20) The device that changes electric energy into mechanical energy (.....)
- 21) A bond resulting from the participation of each of the two atoms with three electrons (.....)
- 22) Elements that don't participate in chemical reaction under the ordinary conditions due to the completeness of their outermost energy levels. (.....)
- 23) The gas that acts as a greenhouse (.....)
- 24) They are waves that produced due to vibration of medium particles, and they need a medium to transfer through (.....)
- 25) The layer that protects living organisms from harmful UV. (.....)
- 26) Resistant forces originate between the object in motion and the medium touching it. (.....)
- 27) It is a property of an object to resist the change of its state from rest to motion (.....)
- 28) Waves, which are spread out in all media and space with extremely great speed (.....)
- 29) Gas used by plants to form proteins (.....)

- 30) A gas represents 21 % of the air volume (.....)
-
- 31) Compounds resulted from the combination between oxygen and an element even though it is a metal or a nonmetal (.....)
-
- 32) Elements have more than 4 electrons in outer level. (.....)
-
- 33) Technological application is used in cars and planes to protect passengers from inertia. (.....)
-
- 34) The measuring unit of the weight. (.....)
-
- 35) The wave which is produced by the vibration of a medium particles. (.....)
-
- 36) The galaxy that our system belongs to. (.....)
-
- 37) A rock that is produced from the conversion of limestone (.....)
-
- 38) Rocks that are formed when old rocks (igneous or sedimentary) are subjected to pressure and high temperature (.....)
-
- 39) A rock which has a pink or grey colour and found in eastern desert. (.....)
-
- 40) A rock formed of lava flows when it comes on the Earth's surface (.....)
-
- 41) Rocks which are formed of molten materials after solidification (.....)
-

***(2) Choose the right answer:**

1. Water masses on Earth's surface form about

- a. 30% b. 50% c. 71% d. 90%

2. When a nitrogen atom ${}^7\text{N}$ gains electrons to complete its outermost shell, it becomes ..

- a. N^{-2} b. N^{-3} c. N^{+3} d. N^{+2}

3. All of the following are covalent molecules except

- a. H_2O b. MgO c. N_2 d. O_2

4. If you are in a moving train, you imagine that the cars moving in the same direction on the road with same speed

- a. stop. b. move forward.
c. move backward. d. move with a high speed.

5. The triple covalent bond is formed in molecule.

- a. hydrogen b. nitrogen c. oxygen d. water

6. In positive ion, the number of protons is the number of electrons.

- a. less than b. more than c. equal to

7. All the following are periodic motions except the

- a. fan motion. b. pendulum motion.
c. train motion. d. sunflower motion.

8. All the following are metals except

- a. iron. b. oxygen. c. copper. d. sodium.

9. From the examples of forces inside living systems is/are

- a. pulse inside blood vessels. b. inertia. c. brakes.

10. All of the following are metallic oxides except

- a. Na_2O b. MgO c. SO_3 d. Al_2O_3

11. Increasing the ratio ofgas in the atmosphere leads to increasing the air temperature.

- a. carbon monoxide b. carbon dioxide c. sulphur dioxide

12. Car brakes are one of the applications of

- a. gravitational force. b. friction force. c. nuclear force.

13. are poisonous and affect the nervous system and the eye.

- a. Cellulose fibers b. Sulphur oxides
c. Carbon oxides d. Nitrogen oxides

14. The gas which reduces the effect of oxygen in burning process is

- a. CO_2 b. H_2O c. N_2 d. Cl_2

15. The normal atmospheric pressure equals cm. Hg.

- a. 76 b. 67 c. 70 d. 72

16. All of the following are metals except

- a. copper. b. aluminum. c. sodium d. oxygen.

17. The chemical formula of sodium hydroxide is

- a. HCl b. Na_2CO_3 c. NaOH d. NaCl

18. The measuring unit of force is

- a. kg. b. newton. c. m/s^2 d. m/s.

19. oxides are resulted during the time of lightning.

- a. Carbon b. Sulphur c. Nitrogen d. Basic

20. All of the following are covalent molecules except

- a. H_2O b. N_2 c. NaCl d. O_2

21. are used in night vision apparatus.

- a. Infrared rays b. Ultraviolet rays c. X-rays d. Gamma rays

22. All of the following are electromagnetic waves except the

- a. sound waves. b. ultraviolet waves. c. infrared rays. d. visible light

23. When a car is at a rest starts moving suddenly, the passengers

- a. rush backward. b. turn upside down. c. rush forward. d. keep steady.

24. All these salts dissolve in water except

- a. sodium chloride. b. potassium sulphate. c. silver chloride.

25. The mass of an object, its weight is 98 newton is

(knowing that the Earth's gravitational acceleration= 9.8 m/s^2)

- a. 10 kg. b. 980 kg. c. 0.98 kg.

26. The layer which consists of molten metals is the

- a. crust. b. mantle. c. outer core. d. inner core.

27. All nonmetals don't conduct electricity except

- a. bromine. b. graphite. c. sulphur. d. phosphorus.

28. During chemical reactions, ($_{19}\text{K}$) atom loses electron(s) and changes into

- a. K^+ b. K^- c. K^{+2} d. K^{-2}

29. is a mechanical wave.

- a. X-ray b. Light c. Sound d. Gamma ray

30. The valency of helium ($_{2}\text{He}$) is

- a. zero b. one c. two d. four

31. Sodium chloride molecule is considered

- a. an acid. b. an alkali. c. an oxide. d. a salt.

32. Lubricating and oiling mechanical machines depend on decreasing the effect of force.

- a. inertia b. friction c. attraction d. electromagnetic

33.changes the mechanical energy into electric energy.

- a. Dynamo b. Electromagnet c. Motor d. Electric fan

34. The greatest Earth's layer in thickness is the

- a. Earth's crust. b. inner core. c. outer core. d. mantle.

35. The measuring unit of the speed is

- a. m/sec. b. joule. c. kg. d. newton.

36. If ($_{13}\text{Al}$) combines with ($_8\text{O}$), the chemical formula of the formed compound is

- a. Al_3O_2 b. AlO c. AlO_2 d. Al_2O_3

37. If the weight of a body is 400 N, knowing that the Earth's gravitational acceleration is 10 m/sec.^2 , its mass equals

- a. 40 kg. b. 4 kg. c. 4000 kg. d. 80 kg.

38. The type of bond in nitrogen molecule is bond.

- a. double covalent b. single covalent c. triple covalent d. ionic

39. All of nonmetals don't conduct electricity except

- a. bromine. b. aluminum. c. graphite. d. mercury

40. Ammonia combines with HCl producing of ammonium chloride.

- a. white powder b. white ppt. c. white fumes d. white solution

41. is a liquid metal.

- a. Mercury b. Nitrogen c. Magnesium d. Chlorin

42. The chemical formula of hydrochloric acid is

- a. H_2O b. HCl c. H_2SO_4 d. HNO_3

43. The object's weight on Earth's surface is related to

- a. electromagnetic force. b. gravitational force.
c. nuclear force. d. friction force.

44. From circular motion is

- a. pendulum motion. b. movement of Moon around Earth.
c. water wave motion. d. bicycle motion.

45. All of the following forces and operations are applications on friction except

- a. walking on ground.
- b. moving cars.
- c. the work of dynamo.
- d. stopping cars.

46. The substances resulted from burning of coal and cellulose fibers cause

- a. headache.
- b. fainting.
- c. lung cancer.
- d. (a), (b) and (c).

47. The valency of argon is

- a. zero.
- b. monovalent.
- c. divalent.
- d. trivalent.

48. All of the following are monovalent atomic groups except group.

- a. nitrate
- b. bicarbonate
- c. phosphate
- d. nitrite

49. Earth's gravitational acceleration is changed from a place to another on Earth's surface because of

- a. object's mass.
- b. Earth's mass.
- c. the distance from the Earth's centre.

50. The chemical formula of sulphuric acid is

- a. HNO_3
- b. H_2SO_4
- c. HCl

51. There is a single covalent bond in molecule.

- a. hydrogen
- b. nitrogen
- c. oxygen

52. The neutral atom and change to positive ion.

- a. Gain electrons
- b. Charge of nucleus change
- c. number of energy levels increases.
- d. lose electrons

53. The type of bond in water molecule

- a. covalent
- b. single covalent
- c. double covalent

54. Increasing ratio of gas, causing increasing temperature of atmosphere.

- a. CO
- b. CO_2
- c. SO_2
- d. SO_3

55. From accompanied force due to the motion are

- a. force of inertia
- b. friction force
- c. all the previous

56. When car move forward suddenly the passenger rushed

- a. forward
- b. backward
- c. upright

57. From application on force inertia

- a. safety belts
- b. car's break
- c. car tires

58. The objects fall down by effect of

- a. electromagnet force
- b. gravitational force
- c. nuclear force
- d. magnetic force

59. Mass x Earth's gravity acceleration equal

- a. volume
- b. weight
- c. density

60. Ozone layer absorb

- a. visible rays
- b. infrared rays
- c. ultraviolet rays
- d. x-rays

61. layer is rich of Iron and nickel.

- a. inner core
- b. crust
- c. outer core
- d. mantle

62. The gases that cause buildings corrosion is/are

- a. nitric oxide.
- b. carbon dioxide.
- c. sulphur oxides.
- d. nitrogen oxides.

63. All the following are electromagnetic waves except for the

- a. thermal rays.
- b. visible light.
- c. sound waves.
- d. ultraviolet rays.

64. In the periodic motion

- a. the pathway is straight.
- b. is regularly repeat
- c. time is regularly repeated
- d. .

65. When the horse is tripped, the rider is suddenly pushed forward, this is related to the force of

- a. inertia.
- b. centrifugal force .
- c. attraction.
- d. the horse pushing.

66. are examples of sedimentary rocks.

- a. Granite and basalt
- b. Marble and sandstone
- c. Sandstone and limestone
- d. Basalt and limestone

67. is produced from the conversion of limestone.

- a. Granite
- b. Marble
- c . Basalt
- d . Sandstone

68. The metamorphic rocks are produced as a result of the effect of on rocks.

- a. high temperature
- b. high pressure
- c. (a) and (b)
- d. no correct answer

***(3) Complete the following :**

1. $C + O_2 \rightarrow$
2. $2CO + O_2 \rightarrow$
3. $2Mg + O_2 \rightarrow$
4. The layer in the atmospheric air protects living organisms from harmful rays.
5. Green plants use gas in photosynthesis process.
6. The bond in an oxygen molecule is a bond, while the bond in a nitrogen molecule is a bond.
7. Electric motor works on changing energy into energy.
8. Acids change the color of litmus paper into , while bases change the colour of litmus paper into
9. Motion is classified into two types, which are and
10. + $\rightarrow 2MgO$
11. Sound waves are example of waves, while light waves is example of waves.
12. The chemical bond in hydrogen molecule (H_2) is a , while the chemical bond in nitrogen molecule (N_2) is
13. Electric generator changes energy into energy.
14. and are salts insoluble in water.
15. The car passengers are pushed when the car stops suddenly by the effect of force.
16. force prevents feet from slipping on road, while force helps in keeping the atmosphere around Earth.
17. The object's weight increases as the distance from Earth's center
18. and are examples of monovalent atomic groups.
19. Dynamo changes energy into energy.
20. Oil and lubricants are used in machines to
21. Water covers from Earth's surface.
22. produced from lightning that affect the nervous system and eye.
23. $2Mg +$ $\rightarrow 2MgO$

24. The motion of simple pendulum is motion, while the motion of train is motion.
25. $\text{NH}_3 + \dots \rightarrow \text{NH}_4\text{Cl}$, the type of this reaction is
26. The bond in oxygen molecule is bond,, while that in calcium oxide is bond.
27. is an example for acids, while is an example for bases.
28. Nitrogen oxide affects system and the
29. Green plants use gas in photosynthesis process and use gas to form proteins.
30. layer protects living organisms from harmful rays
31. $\text{H}_2 + \text{Cl}_2 \rightarrow \dots$.
32. The chemical equation should be to achieve the law of conservation of mass
33. The valency of $_{18}\text{Ar}$ is....., while that of $(\text{CO}_3)^{-2}$ is
34. According to the law of conservation of mass, the sum of masses equals the sum of masses.
35. and are from the examples of transitional motion.
36. The electromagnet changes energy into energy.
37. Earth consists of a number of arranged layers from the surface to the center, as follows the crust, and
38. On dissolving acids in water, they give ions, while on dissolving in water, they give negative hydroxide ions $(\text{OH})^-$
39. motion is regularly repeated at equal periods of time.
40. is the only liquid metal, while is the only liquid nonmetal.
41. The bond in sodium chloride molecule (table salt) is Whereas in water molecule is
42. Electromagnet is used to make and
43. Elements classified into, and.....
44. The valency of $_{13}\text{Al}$ is....., while that of $_{20}\text{Ca}$ is.....
45. an effect attempts to change object phase from static to motion or vice versa or change motion direction.

46. During chemical reaction, sodium atom tend to..... one electron and changes into
47. The bond in oxygen molecule is while that of calcium oxide is
48. The outer level in $_{17}\text{Cl}$ has electron(s), so it form ion.
49. The measuring unit of weight is while that of gravity acceleration is and that of mass is
50. The erosion of machine parts is from the harms of
51. The valency of sulphate group is while that of hydroxide group is
52. CO_2 gas acts as around the Earth
53. Granite rock consists of , and minerals , while basalt rock consists of , and minerals .
54. Igneous rocks are divided according to the site of their formation in the Earth's surface into and
55. Plutonic rocks have crystals with size , while volcanic rocks have crystals with size.
56. Sandstone and are examples of rocks .
57. is a sedimentary rock.
58. The main component of sandstone is mineral
59. Marble is resulted from transformation of
60. Granite is from igneous rocks , while basalt is from igneous rocks

✱(4) **Correct the underlined words:**

1	Fresh water represents 97 % and exists in oceans and seas.	(.....)
2	Mass of an object is the Earth's ability to attract that object	(.....)
3	The idea of machines lubrication is depends on the decreasing of the gravity	(.....)
4	Salts are substances that dissociate in water producing negative hydroxide ions (OH) ⁻ .	(.....)
5	The water bodies represent about 50% of the Earth's surface	(.....)
6	The chemical formula of sodium chloride is AgCl	(.....)
7	Carbon oxides are resulted at the time of lightning	(.....)
8	Hydrogen gas is used by plants to form proteins	(.....)
9	Water molecule consists of three atoms for four elements	(.....)
10	Nonmetals are bad conductors of electricity except sulphur	(.....)
11	The motion of simple pendulum is circular motion	(.....)
12	The bond in magnesium oxide is single covalent bond	(.....)
13	The change of an object's position as time passes according to a frame of reference is called average motion	(.....)
14	The atmospheric pressure is about 90 cm.Hg	(.....)
15	Friction causes a great loss of chemical energy	(.....)
16	The bond in oxygen molecule is a triple covalent bond	(.....)

17	The motion of simple pendulum is an example of <u>wave</u> motion	(.....)
18	<u>Nitrogen oxides</u> cause headache and stomach-aches	(.....)
19	On burning magnesium strip in air, a <u>black</u> powder is formed	(.....)
20	The passengers are rushed backward when the car moves suddenly due to <u>friction</u> force.	(.....)
21	Water molecule consists of <u>four</u> atoms for two elements.	(.....)
22	Safety belts in cars work on <u>increasing</u> the forces of inertia	(.....)
23	The common name of sodium <u>hydroxide</u> is table salt.	(.....)
24	The chemical formula of nitric acid is <u>(H₂SO₄)</u>	(.....)
25	<u>Oxides</u> are substances that dissociate in water producing positive hydrogen ions.	(.....)
26	when <u>oxygen</u> gas reacts with hydrochloric acid, white clouds is formed.	(.....)
27	Green plants use <u>oxygen</u> gas during photosynthesis process.	(.....)
28	(CO ₂) is a <u>metal</u> oxide.	(.....)
29	<u>Granite</u> rock is composed of olivine, pyroxene and feldspar minerals	(.....)

✱(5) Give reason for:

1. White clouds are formed when ammonia gas reacts with conc. hydrochloric acid.

.....

2. The car passengers are rushed forward when the moving car stops suddenly.

.....

3. Ionic bonds produce compounds only not elements, but covalent bonds produce both element and compound.

.....

4. CO₂ gas acts as a greenhouse effect.

.....

5. Earth's inner core is rich in iron and nickel.

.....

6. Steadfastness of the hydrosphere on the Earth's surface

.....

7. We see lightning before hearing thunder.

.....

8. The sunlight reaches to us, but we can't hear the sound of solar explosions.

.....

9. The chemical equation should be balanced.

.....

10. Lubricating and oiling mechanical machines.

.....

11. Presence of life on the Earth's surface.

.....

.....

12. Safety belts are used in cars.

.....

13. Potassium (¹⁹K) is monovalent, while oxygen (⁸O) is divalent.

.....

14. When an atom gains an electron or more, it becomes a negative ion.

.....

15. The valency of noble gases is zero.

.....

16. Acids turn the color of litmus to red.

.....

17. Sodium is monovalent element.

.....

18. Without ozone layer, all living organisms on Earth will die.

.....

✱(6) What happen if:

1. The car stops suddenly.

.....

2. When an electric current passes through an insulated copper wire coiling around a bar of soft iron.

.....

3. Machines are not lubricated.

.....

4. Approaching a wet rod with hydrochloric acid to ammonia gas.

.....

5. The increase of the percentage of carbon dioxide in the atmospheric air.

.....

6. There is no atmosphere around the Earth.

.....

7. Putting litmus paper in a beaker contains HCl

.....

8. An atom loses one electron or more.

.....

9. A bird migrates from the north pole to the equator (concerning its mass and weight).

.....

10. Burning magnesium ribbon in air. (chemical equation).

.....

11. Old rocks are subjected to high heat, pressure or both of them

.....

***(7) Put (\checkmark) or (X) :**

- | | |
|--|--------|
| 1. Acid change the colour of red litmus paper into blue. | () |
| 2. The normal atmospheric pressure is 70 cm.Hg. | () |
| 3. Mantle layer lies beneath the Earth's outer core. | () |
| 4. Earth's radius between the two poles is larger than that at the equator. | () |
| 5. Some elements have more than one valency such as iron (Fe). | () |
| 6. Sodium hydroxide changes the colour of litmus paper into red. | () |
| 7. The exerted work to lift an object increases by increasing the object's mass. | () |
| 8. Green plants use O_2 gas in photosynthesis process. | () |
| 9. Bromine is a liquid nonmetal. | () |
| 10. Base is a substance dissolves in water giving $(OH)^-$ | () |
| 11. The motion of simple pendulum is a transitional motion. | () |
| 12. The sound and water waves are examples of electromagnetic waves. | () |
| 13. The number of known elements is 118 | () |
| 14. In the positive ions, the number of electrons more than the number of protons. | () |
| 15. Argon is considered as a noble gas. | () |
| 16. The percentage of salty water in the Earth is 3% | () |
| 17. Crust is the outer layer of Earth. | () |
| 18. Green plants use carbon dioxide gas in photosynthesis process. | () |
| 19. All nonmetals conduct electricity. | () |
| 20. An element, its atomic number is 20, so its valency is monovalent. | () |
| 21. Lead sulphate salt dissolves in water. | () |
| 22. Both mercury and bromine exist in liquid state. | () |
| 23. The burning of carbon in presence of oxygen is a direct combination. | () |
| 24. The weight of object decreases with increasing its mass. | () |
| 25. The Earth's inner core is rich in iron and nickel. | () |
| 26. By increasing the ratio of CO_2 , the air temperature decreases. | () |
| 27. The force is measured in newton. | () |

28. Water covers about 50% of the Earth's surface.	()
29. Temperature on the Earth's surface suits the life of living organisms.	()
30. All non-metals are bad conductor of electricity except graphite	()
31. Lithium ion has one positive charge	()
32. All non-metals are solid except mercury	()
33. The bond in oxygen molecule is triple covalent	()
34. In ionic bond is formed due to attraction between positive and negative ions	()
35. Water molecule consists of 2 atoms of two elements	()
36. The chemical formula of nitric acid is HNO_3	()
37. Sodium hydroxide and lime water are bases but magnesium carbonate is salt	()
38. Potassium sulphate salt is dissolve in water	()
39. The burning of carbon in presence of oxygen is direct combination	()
40. Oxygen reacts with carbon and carbon monoxide forming CO_2	()
41. Nitrogen oxides formed during earthquake	()
42. Electric current has magnetic effects	()
43. The sound and water waves are examples of Electromagnetic wave.	()
44. Radio waves used in photographic	()
45. Atmosphere contains ozone layer which protects us from ultraviolet rays .	()
46. Silver chloride (AgCl) dissolves in water	()
47. The mantle layer lies under the Earth's outer core	()

*** (8) (Define) What is meant by ...?**

1. Force.

.....

.....

2. The ion

.....

.....

3. Inertia.

.....

.....

4. Friction forces

.....

.....

5. Negative ion.

.....

.....

6. Ionic bond.

.....

.....

7. Valency.

.....

.....

8. Relative motion.

.....

.....

9. Chemical reaction.

.....

.....

10. Chemical equation.

.....

.....

✳(9) Write the chemical formula for each of the following :

1. Sulphuric acid.
2. Aluminium oxide.
3. Copper carbonate
4. Ferric hydroxide.
5. Hydrogen chloride
6. Calcium carbonate.
7. Copper sulphate.
8. Sodium sulphate.
9. Aluminium carbonate.
10. Ammonium nitrate.
11. Calcium hydroxide.
12. Sodium bicarbonate.
13. Aluminium hydroxide.
14. Ammonium sulphate.
15. Ferric oxide.
16. Calcium chloride.
17. Silver nitrate.
18. Calcium nitrate
19. Ferrous oxide.
20. Silver chloride.
21. Sodium sulphate.

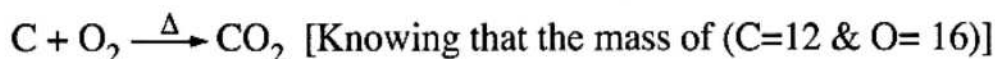
✳(10) Write the chemical equation representing the following reactions, then indicate the type of reaction :

1. The reaction between carbon monoxide with oxygen.
2. Hydrochloric acid is combined with ammonia gas.
3. The burning of magnesium ribbon in the air.
4. Burning coal in air.
5. Reaction between hydrogen and chlorine.
6. Reaction between nitrogen monoxide with oxygen.

*(11) Problems:

1

Calculate the masses of reactants and products in the following reaction :



.....

.....

.....

2

The opposite figure illustrates an Earth's sector :

1. Write the labels (1,2, 3 and 4).
2. What are the elements that form layer no. (4) ?



.....

.....

3

Write down the electronic configuration of each of the following atoms, and then mention the type of each atom (metal – nonmetal) : $_{12}\text{Mg}$ – $_{16}\text{S}$

.....

.....

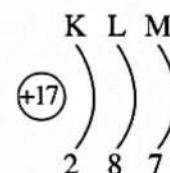
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4

From the electronic configuration for the following element, Complete :

1. The type of element :
2. The valency of element :
3. The ion of element :
4. The type of chemical bond when it combines with sodium ($_{11}\text{Na}$) :



.....

.....

5

An object of weight 98 N. Calculate its mass knowing that the Earth's gravitational acceleration is 9.8 m/sec^2 .

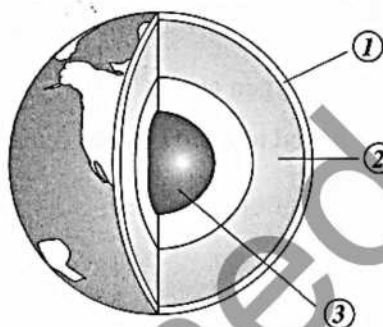
6

Calculate the weight of 0.8 kg mass ball, knowing that Earth's gravitational acceleration is 9.8 m/sec^2 .

7

The following figure represents the layers of Earth :

Mention the name of each layer and its thickness.



8

Calculate the mass of an object, if its weight is 460 newton, knowing that the Earth's gravitational acceleration is 10 m/sec^2

9

Calculate the total mass of reactants and products in the following reaction :

$2\text{Mg} + \text{O}_2 \xrightarrow{\Delta} 2\text{MgO}$ (Knowing that the mass of Mg = 24 & O = 16).

10

Match :

(A)	(B)
1. The chemical formula of sodium sulphate	a. electromagnetic wave.
2. Sound	b. NaCl
3. Light	c. Na_2SO_4
4. $_{12}\text{Mg}$	d. metal.
5. $_{17}\text{Cl}$	e. nonmetal.
6. The chemical formula of sodium chloride.	f. mechanical wave.

1-

2-

3-

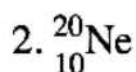
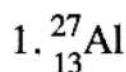
4-

5-

6-

11

Write the electronic configuration and valency for the following elements :

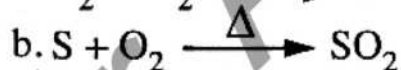


12

Problems :

(Knowing that the mass of : H= 1, Cl= 35.5, S= 32, O= 16).

1. Calculate the masses of reactants and products in the following equations :

2. Calculate the weight of an object, its mass is 700 kg. (Knowing that the Earth's gravitational acceleration is 9.8 m/sec^2).

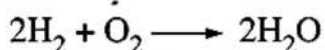
13

Complete the following table :

The chemical formula	KOH	..... (1)	HNO ₃	SO ₃
Its name	..... (2)	Sodium sulphate	..... (3) .....	..... (4)
Its type	..... (5) .....	..... (6) .....	..... (7) .....	..... (8)

14

Calculate the total masses of reactants and products of the following reaction :



Knowing that the mass number of elements as (H = 1 & O = 16)

Model Answer

• (1) Write the scientific term:

1. Atomic group	12. Chemical equation	23. Carbon dioxide	33. Safety belts
2. Periodic motion	13. Object's weight	24. Mechanical waves	34. Newton
3. Chemical reaction	14. Valency	25. Ozone	35. Mechanical waves
4. Object's weight	15. Force	26. Friction force	36. Milky way
5. Metals	16. Ozone	27. Inertia	37. Marble
6. Outer core	17. Ionic bond	28. Electromagnetic waves	38. Metamorphic rocks
7. Mechanical waves	18. Acids	29. Nitrogen	39. Granite
8. Salts	19. Inert gas	30. Oxygen	40. Volcanic rock (basalt)
9. Sulphur oxides	20. Motors	31. Oxides	41. Igneous rock
10. Friction force	21. Triple covalent bond	32. Non-metals	
11. Bromine	22. Inert gas		

• (2) Choose the right answer:

1. C	13. D	25. A	37. A	49. C	61. A
2. B	14. C	26. C	38. C	50. B	62. C
3. B	15. A	27. B	39. C	51. A	63. C
4. A	16. D	28. A	40. C	52. D	64. B
5. B	17. C	29. C	41. A	53. B	65. A
6. B	18. B	30. A	42. B	54. B	66. C
7. C	19. C	31. D	43. B	55. C	67. B
8. B	20. C	32. B	44. C	56. B	68. C
9. A	21. A	33. A	45. C	57. A	
10. C	22. A	34. D	46. D	58. B	
11. B	23. A	35. A	47. A	59. B	
12. B	24. C	36. D	48. C	60. C	

• (3) Complete the following:

1. CO ₂	16. Friction – gravitational	30. Ozone – ultraviolet	48. 7 – negative
2. 2CO ₂	17. Decrease	31. 2HCl	49. Newton – M/s ² – Kg
3. 2MgO	18. Hydroxide – bicarbonate	32. Balanced	50. Friction force
4. Ozone	19. Mechanical – Electric	33. Zero – divalent	51. Divalent – monovalent
5. Oxygen	20. Decrease friction force	34. Reactant – product	52. Green house
6. Double covalent – triple covalent	21. 71%	35. Car – train	53. Quartz, mica and feldspar – olivine, pyroxene and feldspar
7. Electric – mechanical	22. Nitrogen oxide	36. Electric – magnetic	54. Plutonic and volcanic
8. Red – blue	23. O ₂	37. Mantle – core	55. Large – small
9. Periodic – transitional	24. Periodic – transitional	38. Hydrogen – base	56. Limestone – sedimentary
10. 2Mg + O ₂	25. HCl – Direct combination	39. Periodic	57. Sandstone
11. Mechanical – Electromagnetic	26. Covalent – ionic	40. Mercury – bromine	58. Quartz
12. Single covalent – triple covalent	27. Hydrochloric – sodium hydroxide	41. Ionic – single covalent bond	59. Limestone
13. Mechanical – Electric	28. Nervous – eye	42. Electric bell – winch	60. Plutonic – volcanic
14. Silver chloride – lead sulphate	29. Oxygen – nitrogen	43. Metals, non-metals and Nobel gas	
15. Forward – inertia		44. Trivalent – divalent	
		45. Force	
		46. Lose – positive ion	
		47. Double covalent – ionic bond	

***(4) Correct the underlined words:**

- | | | | |
|-------------------|---------------------|----------------------|--------------------|
| 1. Salty | 9. Two | 17. Periodic | 25. Acids |
| 2. Weight | 10. Graphite | 18. Carbon dioxide | 26. Ammonia |
| 3. Friction | 11. Periodic | 19. White | 27. Carbon dioxide |
| 4. Base | 12. Ionic bond | 20. Inertia | 28. Non-metals |
| 5. 71% | 13. Relative motion | 21. Three | 29. Basalt |
| 6. NaCl | 14. 76 | 22. Decrease | |
| 7. Nitrogen oxide | 15. Mechanical | 23. Chloride | |
| 8. Nitrogen | 16. Double | 24. HNO ₃ | |

***(5) Give reason for:**

- Due to the formation of ammonium chloride as white clouds.
$$\text{NH}_3 + \text{HCl} \longrightarrow \text{NH}_4\text{Cl}$$
- Due to inertia, as they try to maintain their state of motion.
- Because ionic bond arises between two different atoms (metal and nonmetal), while covalent bond arises between two similar or different nonmetal atoms.
- Because it prevents the penetration of the thermal rays produced from the Earth to outer space.
- Because they are from heavy elements
- Due to the gravitational force of the Earth.
- Because the light of lightning is from electromagnetic waves, while the sound of thunder is from mechanical waves,
- Because the sunlight is electromagnetic waves which can travel through free space, while the sound of solar explosions is mechanical waves which can't travel through free space.
- To achieve the law of conservation of matter (mass).
- To decrease friction between moving parts of machines
- Due to:
 - The presence of hydrosphere.
 - The presence of the atmospheric envelope containing oxygen gas which is needed for life.
 - Its temperature is suitable during both day and night.
 - Its atmospheric pressure and its gravitational force are suitable.
- Because safety belts work on stopping the forces of inertia
- Because during chemical reactions, potassium atom loses one electron, while oxygen gains or shares with two electrons to complete their outermost shell.
- Because the number of electrons becomes less than the number of protons.
- Because their outermost energy levels are completely filled with electrons so they don't lose, gain or share with any electrons.
- Because acids when dissolved in water produce positive hydrogen ions H⁺
- Because during chemical reactions, it loses one electron
- Because it protects living organisms from harmful ultraviolet radiation.

***(6) What happen if:**

1. The driver and passengers will be rushed forward.
2. The iron bar will attract the iron filings, because the iron bar is changed into a magnet
3. Parts of machines getting hot and erosion occurs.
4. White clouds of ammonium chloride are formed.
5. The temperature of air increases.
6. There is no life.
7. It will change into red
8. It will change to positive ion
9. The mass of the bird remains fixed, while the weight of the bird decreases, because the value of Earth's gravitational acceleration at the equator is less than that at the south pole.
10. A white powder of magnesium oxide is formed.
11. It is converted to metamorphic rock.

***(7) Put (✓) or (X) :**

1. (X)	9. (✓)	17. (✓)	25. (✓)	33. (X)	41. (X)
2. (X)	10. (✓)	18. (✓)	26. (X)	34. (✓)	42. (✓)
3. (X)	11. (X)	19. (X)	27. (✓)	35. (X)	43. (X)
4. (X)	12. (X)	20. (X)	28. (X)	36. (✓)	44. (X)
5. (✓)	13. (✓)	21. (X)	29. (✓)	37. (✓)	45. (✓)
6. (X)	14. (X)	22. (✓)	30. (✓)	38. (✓)	46. (X)
7. (✓)	15. (✓)	23. (✓)	31. (✓)	39. (✓)	47. (X)
8. (X)	16. (X)	24. (X)	32. (X)	40. (✓)	

***(8) (Define) What is meant by ... ?**

1. It is an effect that attempts to change the object's state from being static to motion or vice versa or attempts to change the direction of motion.
2. It is the atom which loses or gains an electron or more during the chemical reaction.
3. It is a property of an object that has to resist the change of its state of rest or motion at a regular speed in a straight line unless an external force acted on it.
4. They are resistant forces (against motion) originated between the object in motion and the medium touching it.
5. It is an atom of a nonmetallic element that gains an electron or more during the chemical reaction.
6. It is a chemical bond resulted from the electric attraction between a positive ion and a negative ion.
7. It is the number of electrons that an atom gains, loses or even shares during a chemical reaction.
8. It is the change in an object's position or direction as time passes relative to another object or a fixed point known as frame of reference
9. It is the breaking of the existing bonds between the atoms of the molecules in the reactants and forming new bonds between the atoms of the molecules in the products.
10. It is a set of symbols and chemical formulae representing the reactants and products molecules in the chemical reaction and it represents the conditions of the reaction as well.

***(9) Write the chemical formula for each of the following:**

1. H_2SO_4	7. CuSO_4	13. $\text{Al}(\text{OH})_3$	19. FeO
2. Al_2O_3	8. Na_2SO_4	14. $(\text{NH}_4)_2\text{SO}_4$	20. AgCl
3. CuCO_3	9. $\text{Al}_2(\text{CO}_3)_3$	15. Fe_2O_3	21. Na_2SO_4
4. $\text{Fe}(\text{OH})_3$	10. NH_4NO_3	16. CaCl_2	
5. HCl	11. $\text{Ca}(\text{OH})_2$	17. AgNO_3	
6. CaCO_3	12. NaHCO_3	18. $\text{Ca}(\text{NO}_3)_2$	

***(10) Write the chemical equation representing the following reactions, then indicate the type of reaction :**

1. $2\text{CO} + \text{O}_2 \longrightarrow 2\text{CO}_2$
2. $\text{NH}_3 + \text{HCl} \longrightarrow \text{NH}_4\text{Cl}$
3. $2\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$
4. $\text{C} + \text{O}_2 \longrightarrow \text{CO}_2$
5. $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$
6. $2\text{NO} + \text{O}_2 \longrightarrow 2\text{NO}_2$

*(11) Problems

1	$\begin{array}{ccc} \text{C} + \text{O}_2 & \xrightarrow{\Delta} & \text{CO}_2 \\ 12 + (2 \times 16) & & (12 + 2 \times 16) \\ 44 \text{ gm.} & & 44 \text{ gm.} \end{array}$ <p>The sum of reactants masses = 44 gm. The sum of products masses = 44 gm.</p>	8	$\begin{aligned} \text{Object's mass} &= \frac{\text{Object's weight}}{\text{Earth's gravitational acceleration}} \\ &= \frac{460}{10} = 46 \text{ kg.} \end{aligned}$
2	<p>1. (1) Earth's crust. (2) Mantle. (3) Outer core. (4) Inner core. 2. Iron and nickel.</p>	9	$\begin{array}{ccc} 2 \text{ Mg} & + & \text{O}_2 & \xrightarrow{\Delta} & 2 \text{ MgO} \\ (2 \times 24) & & (2 \times 16) & & 2 (24 + 16) \\ 48 & + & 32 & & 2 \times 40 \\ 80 \text{ gm} & & & & 80 \text{ gm} \end{array}$ <ul style="list-style-type: none"> The sum of reactants masses = 80 gm. The sum of products masses = 80 gm.
3	<p> $\begin{array}{c} \text{K} \quad \text{L} \quad \text{M} \\ 12 \text{ Mg} \quad \quad \quad \\ 2 \quad 8 \quad 2 \end{array}$ - Metal. $\begin{array}{c} \text{K} \quad \text{L} \quad \text{M} \\ 16 \text{ S} \quad \quad \quad \\ 2 \quad 8 \quad 6 \end{array}$ - Nonmetal. </p>	10	<p>1. c 2. f 3. a 4. d 5. e 6. b</p>
4	<p>1. Nonmetal. 2. Monovalent. 3. Negative ion. 4. Ionic bond.</p>	11	<p> $\begin{array}{c} \text{K} \quad \text{L} \quad \text{M} \\ 1. \text{ }^{27}_{13}\text{Al} \quad \quad \quad \\ 2 \quad 8 \quad 3 \end{array}$ - Trivalent. $\begin{array}{c} \text{K} \quad \text{L} \\ 2. \text{ }^{20}_{10}\text{Ne} \quad \quad \quad \\ 2 \quad 8 \quad 2 \end{array}$ - Zero. $\begin{array}{c} \text{K} \quad \text{L} \quad \text{M} \\ 3. \text{ }^{24}_{12}\text{Mg} \quad \quad \quad \\ 2 \quad 8 \quad 2 \end{array}$ - Divalent. </p>
5	$\text{Object's mass} = \frac{\text{Object's weight}}{\text{Earth's gravitational acceleration}} = \frac{98}{9.8} = 10 \text{ kg.}$	12	<p>1. a. $\text{H}_2 + \text{Cl}_2 \longrightarrow 2\text{HCl}$ $(2 \times 1) + (35.5 \times 2) \quad \quad \quad 2 (1 + 35.5)$ 73 gm 73 gm The sum of reactants masses = 73 gm. The sum of products masses = 73 gm.</p> <p>b. $\text{S} + \text{O}_2 \xrightarrow{\Delta} \text{SO}_2$ $32 + (16 \times 2) \quad \quad \quad 32 + (16 \times 2)$ 64 gm 64 gm The sum of reactants masses = 64 gm. The sum of products masses = 64 gm.</p> <p>2. Object's weight = Object's mass \times Earth's gravitational acceleration = $700 \times 9.8 = 6860$ newton.</p>
6	<p>Object's weight = Object's mass \times Earth's gravitational acceleration = $0.8 \times 9.8 = 7.84$ newton.</p>	13	<p>(1) Na_2SO_4 (2) Potassium hydroxide (3) Nitric acid (4) Sulphur trioxide (5) Base. (6) Salt. (7) Acid. (8) Oxide.</p>
7	<p>① Earth's crust "8 – 60 km" ② Mantle "2885 km" ③ inner core "1350 km"</p>	14	$\begin{array}{ccc} 2\text{H}_2 & + & \text{O}_2 & \longrightarrow & 2\text{H}_2\text{O} \\ 2 (2 \times 1) & + & (2 \times 16) & & 2 (2 \times 1 + 16) \\ 36 \text{ gm} & & & & 36 \text{ gm} \end{array}$ <p>The sum of reactants masses = 36 gm. The sum of products masses = 36 gm.</p>

Science Final Revision

1 Choose the correct answer:

Chemical combination

1. When a nitrogen atom ${}^7_7\text{N}$ gains electrons to complete its outermost shell, it becomes ..
a N^{-2} **b** N^{-3} **c** N^{+3} **d** N^{+2}
2. All of the following are covalent molecules except
a H_2O **b** MgO **c** N_2 **d** O_2
3. The triple covalent bond is formed in molecule.
a hydrogen **b** nitrogen **c** oxygen **d** water
4. In positive ion, the number of protons is the number of electrons.
a less than **b** more than **c** equal to
5. All of the following are metals except
a iron **b** oxygen **c** copper **d** sodium
6. All of the following are covalent molecules except
a H_2O **b** N_2 **c** NaCl **d** O_2
7. All of the following are metals except
a copper **b** aluminum **c** sodium **d** oxygen
8. is a liquid metal.
a Mercury **b** Nitrogen **c** Chlorine **d** Magnesium
9. The type of bond in water molecule is
a ionic **b** single covalent **c** double covalent
10. The type of bond in nitrogen molecule is bond.
a single covalent **b** double covalent **c** triple covalent **d** ionic
11. There is a single covalent bond in molecule.
a hydrogen **b** nitrogen **c** oxygen
12. All nonmetals don't conduct electricity except
a bromine **b** graphite **c** sulphur **d** phosphorus
13. During chemical reactions, (${}_{19}\text{K}$) atom loses electron(s) and changes into
a K^{+} **b** K^{-} **c** K^{+2} **d** K^{-2}
14. The neutral atom and change to positive ion.
a gains electrons **b** loses electrons
c experiences an increase in number of energy levels.
d experiences a change of nucleus charge.

Chemical compounds

15. The chemical formula of hydrochloric acid is
 a HCl b H_2O c H_2SO_4 d HNO_3
16. The chemical formula of sodium hydroxide is
 a HCl b Na_2CO_3 c NaOH d NaCl
17. The valency of argon is
 a zero b monovalent c divalent d trivalent
18. The chemical formula of sulphuric acid is
 a HNO_3 b H_2SO_4 c HCl
19. If ($_{13}Al$) combines with ($_8O$), the chemical formula of the formed compound is
 a Al_3O b AlO c AlO_2 d Al_2O_3
20. The valency of helium ($_2He$) is
 a zero b one c two d four
21. Sodium chloride molecule is considered
 a an acid b an alkali c an oxide d a salt
22. All these salts dissolve in water except
 a sodium chloride b silver chloride c potassium sulphate
23. The chemical formula of carbonate group is
 a $(CO_3)^{-2}$ b CO c $(HCO_3)^{-}$ d CO_2
24. All of the following are monovalent atomic groups except group.
 a nitrate b bicarbonate c phosphate d nitrite

Chemical equation & chemical reaction

25. The substances related from burning of coal and cellulose fibers cause
 a headache b fainting
 c lung cancer d All of the previous answers
26. Increasing the ratio of gas, causing increasing of temperature of atmosphere.
 a CO b CO_2 c SO_2 d SO_3
27. Ammonia combines with HCl producing of ammonium chloride.
 a white powder b white ppt c white fumes d white solution
28. oxides are resulted during the time of lightning.
 a Carbon b Sulphur c Nitrogen d Basic
29. The gas which reduces the effect of oxygen in burning process is
 a CO_2 b H_2O c N_2 d Cl_2

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30. Increasing the ratio of gas in the atmosphere leads to increasing the air temperature.
a carbon monoxide **b** carbon dioxide **c** sulphur dioxide
31. are poisonous and affect the nervous system and the eye.
a Cellulose fibers **b** Sulphur oxides
c Carbon oxides **d** Nitrogen oxides
32. The gases that cause buildings corrosion is/are
a nitric oxide **b** carbon dioxide **c** sulphur oxides

Universal forces in nature

33. The object's weight on Earth's surface is related to
a electromagnetic force **b** gravitational force
c nuclear force **d** friction force
34. Objects fall down by the effect of
a electromagnetic force **b** gravitational force
c nuclear force **d** magnetic force
35. Mass x Earth's gravitational acceleration equals
a volume **b** weight **c** density
36. Earth's gravitational acceleration is changed from a place to another on Earth's surface because of
a object's mass **b** the distance from Earth's center. **c** Earth's mass
37. The mass of an object, its weight is 98 newton is
(knowing that the Earth's gravitational acceleration = 9.8 m/s^2)
a 10 kg **b** 980 kg **c** 0.98 kg
38. Electromagnet is used in making
a electric winch **b** calculator **c** microscope
39. If the weight of a body is 400 N, knowing that the Earth's gravitational acceleration is 10 m/s^2 , its mass equals
a 40 kg **b** 4 kg **c** 4000 kg **d** 80 kg
40. The bar is used in electromagnet is made of
a isolated copper **b** steel iron **c** wrought iron **d** aluminum
41. The measuring unit of force is
a kg **b** newton **c** m/s^2 **d** m/s
42. changes the mechanical energy into electric energy.
a Dynamo **b** Motor **c** Electric fan **d** Electromagnet

Accompanied forces to motion

43. From the application of force of inertia are
a safety belts **b** car brakes **c** car tires

44. From the accompanied force due to motion is/are
a force of inertia **b** friction force **c** all of the previous
45. All of the following forces and operations are applications on friction except
a moving cars **b** stopping cars
c the work of dynamo **d** walking on ground
46. Lubricating and oiling mechanical machines depend on decreasing the effect of force.
a inertia **b** friction **c** attraction **d** electromagnetic
47. If you are in a moving train, you imagine that the cars moving in the same direction on the road with the same speed
a stop. **b** move backward.
c move forward. **d** move with a high speed.
48. From the examples of forces inside living system is/are
a pulse inside blood vessels **b** inertia **c** brakes
49. Car brakes are one of the applications of
a gravitational force **b** friction force **c** nuclear force
50. When the horse is tripped, the rider is suddenly pushed forward, this is related to the force of
a inertia **b** centrifugal force
c attraction **d** the horse pushing

Motion

51. is a mechanical wave.
a X-ray **b** Light **c** Sound **d** Gamma ray
52. are used in night vision apparatus.
a Infrared rays **b** Ultraviolet rays **c** Gamma rays **d** X rays
53. All of the following are electromagnetic waves except the
a sound waves **b** Ultraviolet rays **c** Gamma rays **d** X rays
54. When a car at rest starts moving suddenly, its passengers
a rush backwards **b** rush forwards **c** turn upside down **d** keep steady
55. All the following are electromagnetic waves except for the
a visible light **b** sound waves **c** ultraviolet rays **d** thermal rays
56. From the examples of circular motion is
a Movement of Moon around Earth **b** pendulum motion
c Water wave motion **d** Bicycle motion
57. In the periodic motion
a the pathway is straight **b** the motion is regularly repeated
58. The measuring unit of the speed is
a m/sec **b** kg **c** joule **d** newton

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59. rays are used in remote sensing instruments.
a Infrared rays **b** Ultraviolet rays **c** Gamma rays **d** X rays
60. All of the following are examples of periodic motion except
a fan motion **b** pendulum motion
c train motion **d** sunflower motion

Celestial bodies

61. The distance covered by light in one year = km.
a 5.9×10^{12} **b** 9.467×10^{12} **c** 120 million **d** 6368
62. The farthest planet from the Sun in the solar system is
a Uranus **b** Mercury **c** Neptune **d** Jupiter
63. The nearest planet to the Sun is
a Earth **b** Mercury **c** Neptune **d** Jupiter
64. The distances between stars are measured in unit.
a meter **b** kilometer **c** newton **d** light year
65. The biggest units of the universe are
a planets **b** galaxies **c** moons **d** stars
66. The Earth is located in the solar system at the position from the sun.
a third **b** fourth **c** fifth **d** seventh
67. In addition to the sun, the solar system includes
a eight planets only
b asteroids, meteorites and comets only
c stars and planets
d eight planets, asteroids, meteorites and comets
68. The planets revolve around the Sun in paths.
a circular **b** elliptical **c** spiral **d** irregular

The Earth

69. Earth's inner core is rich in
a copper and iron **b** iron and silver **c** iron and nickel.
70. Ozone layer absorb
a visible rays **b** infrared rays
c ultraviolet rays **d** x-rays
71. layer is rich of Iron and nickel.
a crust **b** mantle **c** outer core **d** inner core
72. The layer which consists of molten metals is the
a crust **b** mantle **c** outer core **d** inner core
73. Water masses on Earth's surface form about
a 30% **b** 50% **c** 71% **d** 90%

74. The Earth takes to rotate around the Sun.
 a 24 hours b 365.25 days c 30 days d 60 minutes
75. The normal atmospheric pressure equals cm Hg.
 a 76 b 67 c 70 d 72
76. The greatest Earth's layer in thickness is the
 a Earth's crust b inner core c outer core d mantle

The Earth's rocks

77. are examples of sedimentary rocks.
 a Granite and basalt b Marble and sandstone
 c Sandstone and limestone d Basalt and limestone
78. rock is characterized by that it is heavy, rough, soil, cohesive and it isn't easily broken.
 a Basalt b Marble c Limestone d Granite
79. has a white color when it is pure and coarse texture.
 a Marble b Limestone c Sandstone d Granite
80. The superficial layer of the Earth's crust is layer.
 a unfragmented b rocky c loosened d thick
81. The volcanic flows is known is as
 a magma b lava c core d mantle

2 Complete each of the following sentences:

- The chemical bond in hydrogen molecule (H_2) is a, while the chemical bond in nitrogen molecule (N_2) is
- The bond in oxygen molecule is while that of calcium oxide is
- Elements classified into, and
- The bond in an oxygen molecule is a bond, while the bond in a nitrogen molecule is a bond.
- During chemical reaction, sodium atom tend to one electron and changes into ..
- The bond in sodium chloride molecule (table salt) is whereas the bond in water molecule is
- The outer level in $_{17}Cl$ has electron(s), so it forms ion.
- The bond in oxygen molecule is bond, while that in calcium oxide is bond.
- is the only liquid metal, while is the only liquid nonmetal.
- The valency of $_{18}Ar$ is, while that of $(CO_3)^{-2}$ is
- Acids change the color of litmus paper into, while bases change the color of

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litmus paper into

12. and are examples of monovalent atomic groups.
13. is an example for acids, while is an example for bases.
14. The valency of $_{13}\text{Al}$ is, while that of $_{20}\text{Ca}$ is
15. On dissolving acids in water, they give ions, while dissolving in water, they give negative hydroxide ions $(\text{OH})^-$.
16. and are salts insoluble in water.
17. The valency of sulphate group is, while that of hydroxide group is
18. $\text{C} + \text{O}_2 \longrightarrow$
19. $2\text{CO} + \text{O}_2 \longrightarrow$
20. $2\text{Mg} + \text{O}_2 \longrightarrow$
21. $\text{H}_2 + \text{Cl}_2 \longrightarrow$
22. According the law of conservation of mass, the sum of masses equals the sum of masses.
23. The chemical equation should be to achieve the law of conservation of mass.
24. Nitrogen oxide affects system and the
25. produced from lightning that affect the nervous system and eye.
26. $\text{NH}_3 + \dots \longrightarrow \text{NH}_4\text{Cl}$, the type of this reaction is
27. + $\longrightarrow 2\text{MgO}$
28. Dynamo (electric generator) changes energy into energy.
29. Electric motor works on changing energy into energy.
30. Egypt seeks to use energy in producing electricity.
31. The object's weight increases as the distance from Earth's center
32. Strong nuclear forces are used in producing of and in purposes.
33. The electromagnet changes energy into energy.
34. an effect that attempts to change object phase from static to motion or vice versa or change motion direction.
35. The weight of an object depends on its and
36. The measuring unit of weight is while that of gravitational acceleration is and that of mass is
37. Electromagnet is used to make and
38. force prevents feet from slipping on road, while force helps in keeping the atmosphere around Earth.
39. Heart muscle and helps the heart to pump blood to all over the body.
40. The car passengers are pushed when the car stops suddenly by the effect of

- force.
41. Oil and lubricants are used in machines to
 42. The erosion of machine parts is from the harms of
 43. and are from the examples of transitional motion.
 44. motion is regularly repeated at equal periods of time.
 45. rays are used in night vision apparatus.
 46. Motion is classified into two types, which are and
 47. Sound waves are example of waves, while light waves is an example of waves.
 48. The motion of simple pendulum is motion, while the motion of train is motion.
 49. The comet consists of two parts which are and
 50. The nearest planet to the Sun is and the farthest one from the Sun is
 51. is the measuring unit between celestial bodies.
 52. The types of telescopes are and
 53. The density of the outer planets is than the density of the inner planets.
 54. The layer in the atmospheric air protects living organisms from harmful rays.
 55. layer protects living organisms from harmful rays.
 56. Earth consists of a number of arranged layers form the surface to the center, as follows:
the crust, and
 57. Green plants use gas in photosynthesis process and use gas to form proteins.
 58. Water covers from Earth's surface.
 59. CO₂ gas acts as around the Earth.
 60. Granite rock consists of, and minerals, while basalt rock consists of, and minerals.
 61. Igneous rocks are divided according to the site of their formation in the Earth's surface into and
 62. Plutonic rocks have crystals with size, while volcanic rocks have crystal with size.
 63. Sandstone and are examples of rocks.
 64. is a sedimentary rock.

3 Write the scientific term for each of the following:

1. Elements that have luster, good conductors of heat and electricity, malleable and ductile and they contain 1, 2 or 3 electrons in their outer electrons shells.
2. The only nonmetal that exists in a liquid state.
3. Elements have more than 4 electrons in outer level.
4. Elements that don't participate in a chemical reaction under the ordinary conditions due to the completeness of their outermost energy levels.
5. A bond resulting from the participation of each of the two atoms with three electrons.
6. An atom of an element does not give or gain any electrons.
7. Type of chemical bonds arises due to electric attraction between positive ion and negative ion.
8. Compounds that dissolve in water producing positive hydrogen ions H^+ .
9. A set of atoms joined together behave like one atom only, having a special valence and it can't be existed solely.
10. Compounds produced as a result of the combination of a positive ion with a negative ion except oxygen;
11. Compounds resulted from the combination between oxygen and an element even though it is a metal or a nonmetal.
12. The number of electrons gained, lost or even shared during a chemical reaction.
13. Breaking the reactants bonds and forming new ones among the products.
14. Oxides which help in building corrosion.
15. A set of symbols and chemical formulae representing reactants and products molecules in chemical reaction.
16. It is an effect that attempts to change state of object from static to motion or vice versa.
17. The product of multiplying object's mass by Earth's gravitational acceleration.
18. The measuring unit of the weight.
19. The ability of the Earth to attract an object to its center.
20. Type of nuclear forces used in medicine and scientific research.

21. The device that changes electric energy into mechanical energy.
22. Resistant forces originate between the object in motion and the medium.
23. Technological application is used in cars and planes to protect passengers from inertia.
24. It is a property of an object to resist the change of its state from rest to motion.
25. Forces produced inside the nucleus.
26. Waves, which are spread out in all media and space with extremely great speed.
27. They are waves that produced due to vibration of medium particles and they need a medium to transfer through.
28. The motion which is regularly repeated in equal periods of time.
29. Rays used in detecting the bone fractures.
30. A system that consists of thousands of millions of stars.
31. The biggest inner planet.
32. The region which separates between the inner and the outer planets.
33. The distance covered by light in one year.
34. Solidified masses of ice, gases and rock pieces revolving around the Sun.
35. The farthest planet from the Sun.
36. The most famous comet.
37. The followers of the planets.
38. The galaxy that our system belongs to.
39. The greatest units which form the universe.
40. They are big-sized bodies emit enormous of heat and light.
41. Distance covered by the light in a year and equals 9.467×10^{12} km.
42. The largest planet in the solar system.
43. Region that separates between Mars and Jupiter.
44. Luminous lines are formed in the sky due to completely burning of small rocky masses in the Earth's atmosphere.
45. Small rocky masses that burn up completely due to friction with Earth's atmosphere.
46. It is a layer of molten metals with a thickness of 2100 km.
47. A gas represents 21 % of the air volume.
48. The gas that acts as a greenhouse.

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49. Gas used by plants to form proteins.
50. The layer of atmosphere which protects us from ultraviolet rays.
51. A rock that is produced from the conversion of limestone
52. Rocks that are formed when old rocks (igneous or sedimentary) are subjected to pressure and high temperature.

4 Put (✓) or (x):

1. Bromine is a liquid nonmetal.
2. The number of known elements is 118.
3. Ionic bond is formed due to the attraction between positive and negative ions.
4. In the positive ions, the number of electrons is more than the number of protons.
5. Argon is considered as a noble gas.
6. All nonmetals conduct electricity.
7. All non-metals are bad conductor of electricity except graphite.
8. All non-metals are solid except mercury.
9. Water molecule consists of 2 atoms of two elements.
10. The bond in oxygen molecule is triple covalent.
11. Both mercury and bromine exist in liquid state.
12. Some elements have more than one valency such as iron (Fe).
13. Acid change the color of red litmus paper into blue.
14. Sodium hydroxide changes the color of litmus paper into red.
15. An element, its atomic number is 20, so its valency is monovalent.
16. Lithium ion has one positive charge.
17. The chemical formula of nitric acid is HNO_3 .
18. Potassium sulphate salt dissolve in water.
19. Sodium hydroxide and lime water are bases but magnesium carbonate is a salt.
20. Lead sulphate dissolves in water.
21. Base is a substance dissolves in water giving $(\text{OH})^-$.
22. Silver chloride (AgCl) dissolves in water.
23. The burning of carbon in presence of oxygen is direction combination.
24. Nitrogen oxides are formed during earthquakes.
25. Oxygen reacts with carbon and carbon monoxide forming CO_2 .
26. The burning of carbon in presence of oxygen is a direct combination.

27. Earth's radius between the two poles is larger than that at the equator.
28. The exerted work to lift an object increases by increasing the object's mass.
29. The force is measured in newton.
30. Dynamo changes heat energy into electric energy.
31. Weak nuclear forces are used in producing electric energy.
32. Electric current has magnetic effects.
33. The weight of object decreases with increasing its mass.
34. Lubricating and oiling reduce friction between moving parts.
35. The sound and water waves are examples of electromagnetic waves.
36. The motion of simple pendulum is a transitional motion.
37. The sound and water waves are examples of electromagnetic wave.
38. Radio waves used in photographic cameras.
39. Ultraviolet rays are used in examining and curing sets for human body.
40. Asteroids' belt is located between the orbits of Earth and Mars.
41. The density of outer planets is lower than the density of inner planets.
42. Our solar system belongs to the milky way galaxy.
43. The biggest acceleration is on Jupiter planet.
44. The small or inner planets are Mercury, Venus, Earth and Saturn.
45. The normal atmospheric pressure is 70 cm Hg.
46. Mantle layer lies beneath the Earth's outer core.
47. Green plants use CO_2 gas in photosynthesis process.
48. The percentage of salty water in the Earth is 3%.
49. The Earth's inner core is rich in iron and nickel.
50. Green plants use carbon dioxide gas in photosynthesis process.
51. By increasing the ratio of CO_2 , the air temperature decreases.
52. Temperature on the Earth's surface suits the life of living organisms.
53. Crust is the outer layer of Earth.
54. Water covers about 50% of the Earth's surface.
55. Atmosphere contains ozone layer which protects us from ultraviolet rays.
56. The types of igneous rocks are plutonic and volcanic rocks.
57. The magma is pushed upwards on occurrence of earthquake.
58. The above layers in sedimentary rocks are the oldest.
59. The colored marble is free from impurities.
60. Quartz mineral is the main component in granite rock.

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5 Correct the underlined words:

1. The bond in oxygen molecule is a triple covalent bond.
2. The bond in magnesium oxide is a single covalent bond.
3. Nonmetals are bad conductors of electricity except sulphur.
4. CO₂ is metal oxide.
5. The chemical formula of nitric acid is (H₂SO₄).
6. Oxides are substances that dissociate in water producing positive hydrogen ions.
7. Water molecule consists of four atoms for two elements.
8. The chemical formula of sodium chloride is AgCl.
9. Salts are substances that dissociate in water producing negative hydroxide ions (OH)⁻.
10. Sulphur oxides are poisonous acidic gases that affect the nervous system and the eye.
11. Carbon oxides are resulted at the time of lightning.
12. Nitrogen oxides cause headache and stomach-aches.
13. On burning magnesium strip in air, a black powder is formed.
14. When oxygen gas reacts with hydrochloric acid, while clouds is formed.
15. The common name of sodium hydroxide is table salt.
16. Mass of an object is the Earth's ability to attract that object.
17. Electric generator (dynamo) converts the kinetic energy into heat energy.
18. Egypt seeks to use nuclear energy in producing medicine.
19. Friction causes a great loss of chemical energy.
20. Safety belts in cars work on increasing the forces of inertia.
21. The passengers are rushed backward when the car moves suddenly due to friction force.
22. The idea of machines lubrication is depends on the decreasing of the gravity.
23. Passengers are rushed forward when a car at rest moves forward suddenly.

24. The change of an object's position as times passes according to a frame of reference is called **average motion**.
25. **Ultraviolet rays** are used in photographing bones to detect the sites of bone fractures.
26. The motion of simple pendulum is **circular** motion.
27. **Meteors** consist of masses of rocks, ice and solidified gases.
28. The distances between stars are measured by a unit called **kilometer**.
29. The Earth occupies the **fifth** position according to its distance from the Sun.
30. **Fresh** water represents 97% and exists in oceans and seas.
31. The atmospheric pressure is about **80 cm Hg**.
32. The water bodies represent about **50%** of the Earth's surface.
33. Green plants use **oxygen** gas during photosynthesis process.
34. **Hydrogen** gas is used by plants to form proteins.

6 Given reason for:

1. The bond in water molecule is a single covalent bond.
.....
2. When an atom gains an electron or more, it becomes a negative ion.
.....
3. Ionic bonds produce compounds only not elements, but covalent bonds produce both element and compound.
.....
4. The chemical equation should be balanced.
.....
5. We can obtain sodium chloride solution and not silver chloride solution.
.....
6. Acids turn the color of litmus paper into red.
.....
7. Sodium is a monovalent element.
.....
8. The valency of noble gases is zero.
.....
9. Potassium ($_{19}\text{K}$) is monovalent, while oxygen ($_{8}\text{O}$) is divalent.
.....

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10. White clouds are formed when ammonia gas reacts with conc. hydrochloric acid.

11. An object's weight is changed from a planet to another.

12. The gravity on the Earth's surface is greater than that on Mars surface.

13. The car passengers are rushed forward when the moving car stops suddenly.

14. Car tires are covered with a very coarse substance.

15. Safety belts are used in cars.

16. Lubricating and oiling mechanical machines.

17. Astronauts can't hear each other voices directly in space.

18. The sunlight reaches to us, but we can't hear the sound of solar explosions.

19. Infrared rays are used in cooking.

20. We see lightning before hearing thunder.

21. The presence of white color surrounds the planet Earth.

22. Presence of life on the Earth's surface.

23. The density of the outer planets is low.

24. Jupiter, Saturn, Uranus and Neptune are called the outer giant planets.

25. Without ozone layer, all living organisms on Earth will die.

26. Earth's inner core is rich in iron and nickel.

27. Steadfastness of the hydrosphere on the Earth's surface.

28. CO₂ gas acts as a greenhouse effect.

7 What happens if?

1. An atom loses one electron or more.

2. Putting litmus paper in a beaker containing HCl.

3. Approaching a wet rod with hydrochloric acid to ammonia gas.

4. Burning magnesium ribbon in air.

5. Burning of coal and cellulose fibers.

6. When an electric current passes through an insulated copper wire coiling around a bar of soft iron.

7. Machines are not lubricated.

8. The car stops suddenly.

9. Two objects move at the same speed and in the same direction.

10. A bird migrates from the north pole to the equator (concerning its mass and weight).

11. Meteors enter the atmosphere.

12. There is no atmosphere around the Earth.

13. The increase of the percentage of carbon dioxide in the atmospheric air.

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8 Write the balanced chemical equations expressing the following reactions:

1. The burning of magnesium ribbon in the air.
.....
2. Burning coal in air.
.....
3. The reaction between carbon monoxide with oxygen.
.....
4. Reaction between nitrogen monoxide with oxygen.
.....
5. Reaction between hydrogen and chlorine.
.....
6. Hydrochloric acid combination with ammonia gas.
.....

9 Write the chemical formula for each of the following compounds:

1. Sulphuric acid.
2. Calcium hydroxide.
3. Sodium nitrate.
4. Aluminium oxide.
5. Copper carbonate.
6. Calcium nitrate.
7. Ferric hydroxide.
8. Ferrous carbonate.
9. Hydrogen chloride.
10. Calcium carbonate.
11. Copper sulphate.
12. Sodium sulphate.
13. Aluminium carbonate.
14. Ammonium nitrate.
15. Calcium hydroxide.
16. Sodium bicarbonate.
17. Aluminium hydroxide.
18. Hydrochloric acid.

19. Aluminium oxide.
20. Copper nitrate.
21. Ammonium sulphate.
22. Ferric oxide.
23. Calcium chloride.
24. Silver nitrate.
25. Calcium nitrate.
26. Ferrous oxide.
27. Silver chloride.
28. Sodium sulphate.

10 What is the function (use) of ...?

1. Chemical reaction.
.....
2. Electromagnet.
.....
3. Electric generator (dynamo).
.....
4. Electric motor.
.....
5. Strong nuclear force.
.....
6. Weak nuclear force.
.....
7. Friction force.
.....
8. Infrared rays.
.....
9. Ultraviolet rays.
.....
10. Gamma rays.
.....
11. X-rays.
.....

12. Visible light.

.....

13. Telescopes.

.....

14. Nitrogen gas.

.....

15. Ozone layer.

.....

16. Gravity on Earth.

.....

11 Important problems:

1. Five elements (A, B, C, D and E) their atomic numbers respectively (10, 11, 17, 18 and 19):

- (a) Which of these elements is a metal and which is a nonmetal?
- (b) Which of them, its molecule is formed of 2 atoms?
- (c) Which of these elements doesn't combine with other elements? (Give reason)
- (d) Does element (C) combine with element (D) and why?
- (e) Which of these elements form an ionic bond?
- (f) Which of these elements form a covalent bond?

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2. Write the electronic configuration of the atoms of the following elements ($_{18}\text{Ar}$ - $_{12}\text{Mg}$ - $_{16}\text{S}$ - $_{17}\text{Cl}$ - $_{10}\text{Ne}$ - $_{13}\text{Al}$), then indicate:

- (a) The type of each atom (metal - nonmetal - noble).
- (b) The type of each ion (positive - negative - has no ions).
- (c) Valency of each atom.

.....
.....
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.....

3. Study the opposite figures and answer the following questions:

(a) The type of each element.

.....

(b) The valency of each element.

.....

(c) The ion of each element.

.....

(d) The type of chemical bond when each of them combines with sodium ($_{11}\text{Na}$).

.....



Fig (a)



Fig (b)

4. Study the following chemical reaction, then answer the question:

Sodium hydroxide + Nitric acid \longrightarrow Sodium nitrate + Water

(a) Write the balanced symbolic equation that represents this chemical reaction.

(b) Show how the conservation law of matter is achieved in this reaction.

[knowing that the mass of (H = 1 & O = 16 & Na = 23 & N = 14)].

.....

5. Calculate the masses of reactants and products in the following reaction:

$\text{C} + \text{O}_2 \xrightarrow{\Delta} \text{CO}_2$ [knowing that the mass of (C = 12 & O = 16)].

.....

6. Calculate the total mass of reactants and products in the following reaction:

$2\text{Mg} + \text{O}_2 \xrightarrow{\Delta} 2\text{MgO}$ [knowing that the mass of (Mg = 24 & O = 16)].

.....

7. Calculate the total mass of reactants and products in the following reaction:

$\text{H}_2 + \text{Cl}_2 \xrightarrow{\Delta} 2\text{HCl}$

$\text{S} + \text{O}_2 \xrightarrow{\Delta} \text{SO}_2$

$2\text{H}_2 + \text{O}_2 \xrightarrow{\Delta} 2\text{H}_2\text{O}$

[knowing that the mass of (H = 1 & Cl = 35.5 & S = 32 & O = 16)].

.....

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8. An object of weight 98 N. Calculate its mass knowing that the Earth's gravitational acceleration is 9.8 m/sec^2 .

.....

.....

.....

.....

9. Calculate the weight of an object whose mass is 0.8 kg, knowing that the Earth's gravitational acceleration is 10 m/sec^2 .

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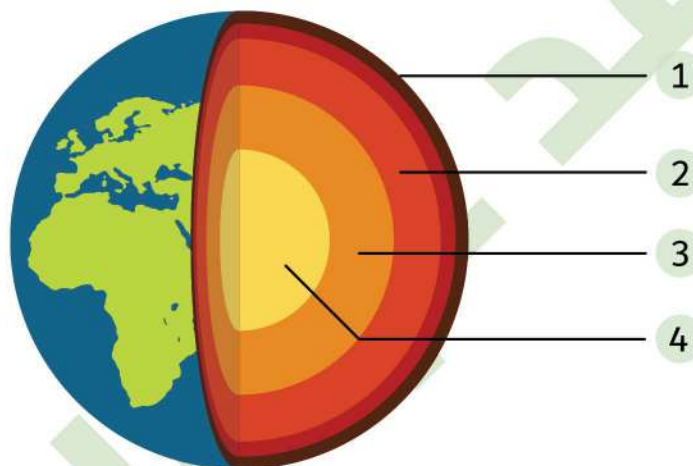
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10. The following figure represents the layers of Earth:

(a) Mention the name of each layer and its thickness.

(b) Which layer is formed of molten metals?



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Question 3: Write the scientific term that indicated by each of the following statements:

- 1- The earth attraction force to an object.
- 2- A movement repeated regularly on equal intervals of time.
- 3- A natural solid material that exists in the crust and consists of one mineral or a group of minerals.
- 4- Masses of the molten materials spread on the sides of a volcano.
- 5- The property of object resistance to change its state from the rest or movement unless a force affects on it.
- 6- The number of electrons lost, gained or shared by the atom during a chemical reaction.
- 7- Breaking out the bonds between the molecules of reactants and formation of new bonds between the molecules of products of the chemical reaction.

Question 5: Give reasons:

- 1- The components of basalt rock are not seen by the naked eye.
- 2- The presence of a white colour surrounds the planet earth.
- 3- We see the lightning before hearing thunder.
- 4- Electric fan still works for few second after cutting off the electric current.
- 5- The bond in the water molecule is single covalent bond.

Question 6: Write the electronic configuration for the following

elements: $_{17}\text{Cl}$ $_{11}\text{Na}$ $_{19}\text{K}$

Question 7: Write the technological applications used in the following fields:

- 1- Medical examinations. 2- Communications. 3- Photography.



Answer Q1

- 1- winches (cranes) - electric bells
- 2- decreases
- 3- ملغي
- 4- ionic - single covalent
- 5- reflecting telescope and refracting telescope
- 6- ملغي
- 7- hydrogen - hydroxide

Answer Q2

- 1- b
- 2- c
- 3- c
- 4- c

Answer Q3

- 1- The object's weight
- 2- periodic motion
- 3- ملغي
- 4- ملغي
- 5- Inertia
- 6- Valency
- 7- Chemical reactions

Answer Q4

ملغي



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Answer Q5

1- ملغي

2- due to presence of the atmosphere which appears as white colour around the Earth

3- Because the light of lightening is from electromagnetic waves, while the sound of thunder is from mechanical waves, as the speed of electromagnetic waves is much greater than that of mechanical waves.

4- Due to inertia, as its arms try to maintain its state of motion.

5- Because oxygen atom shares with two electrons, while each hydrogen atom shares with one electron only to become the outermost energy level for each of them completed with electrons.

Answer Q6

	K	L	M	N
$_{17}\text{Cl}$	2	8	7	
$_{11}\text{Na}$	2	8	1	
$_{19}\text{K}$	2	8	8	1

Answer Q7

1- Ultraviolet rays , x-rays and Gamma rays

2- Wireless waves

3- Visible light and infrared rays

Exercises 2

Question 1: Complete the following statements:

- 1- Some non- metals are gases asand others are solids as
- 2- The bond in magnesium oxide compound is, but the bond in molecule of water is
- 3- On dissolving acids in water , they giveions , while on dissolving alkalis in water , they give ions .
- 4- $\text{NH}_3 + \text{HCl} \xrightarrow{\text{Conc.}} \dots\dots\dots$
- 5- $2\text{CO} + \text{O}_2 \xrightarrow{\Delta} \dots\dots\dots$
- 6- The chemical formula of water isbut the chemical formula of sulphuric acid is
- 7- The chemical formula of hydrochloric acid is but the chemical formula of sodium hydroxide is
- 8- Waves are divided into two types which are waves and waves .
- 9- From the sets which depend on electromagnet forces to work is the
- 10- rays are used in remote sensing instruments .
- 11- The nearest planet to the sun is, but is the biggest one in the solar system .
- 12- The types of telescopes are and
- 13- The Earth consists of a number of arranged layers from the surface to the center ; the crust , and
- 14- The layer in the atmospheric air protects living organisms from the harmful rays .



- 15- Granite is an igneous rock that consists of three minerals quartz ,
..... and
- 16- Granite is from rocks, but limestone is from
.....rocks .
- 17- The intensity of the earthquake is measured by and
..... is an apparatus for recording the earthquakes .

Question 2 : Write the scientific term :

- 1- It is an atom that loses one electron or more during the chemical reaction . ()
- 2- It is an atom that gains one electron or more . ()
- 3- A bond resulting between two non- metallic atoms through the participation of each atom by three electrons . ()
- 4- Elements whose outermost shells are completely filled with electrons and don't participate in chemical reactions under the ordinary conditions . ()
- 5- The number of electrons gained , lost or even shared by an atom during a chemical reaction . ()
- 6- Elements have luster , good conductors of heat and electricity and they contain less than (4) electrons in the outermost energy level . ()
- 7- A set of symbols and chemical formulae expressing the reactants , the products and the reaction conditions if they exist .
- 8- Breaking of the existing bonds in the reactants molecules and forming of new bonds in the products molecules . ()
- 9- The motion which is regularly repeated in equal periods of time . ()

- 10- It is the motion of an object in which its position is changed relative to a fixed point . ()
- 11- The distance covered by light in one year . ()
- 12- Spherical dark bodies , their number is eight revolve around the sun in one direction . ()
- 13- Small space bodies that are affected by the planets gravity . ()
- 14- Huge solid rocky masses that fall in space and do not burn completely and some parts of it reach to the Earth's surface . ()
- 15- It is relatively light outer layer of the Earth, its thickness is ranging between 8-60 Km. ()
- 16- It is any natural material that exists in the Earth's crust and is formed of one mineral or a group of minerals . ()
- 17- A fracture in the rocks of the Earth's crust that moves the rocks on its sides . ()
- 18- Rapid and successive shakes of the ground , take place one after the other . ()
- 19- It is an opening in the Earth's crust which permits the passage of molten materials and the prisoned gases . ()

Question 3 : Define

- 1- Positive ion .
- 2- The atomic group .
- 3- Force .
- 4- Inertia .
- 5- Meteorites .
- 6- Comets .
- 7- Moons .
- 8- Asteroids .
- 9- Outer planets .
- 10- Inner planets .
- 11- Earthquake .
- 12- Volcano .

Question 4 : Give reasons for:

- 1- Nobel gases don't participate in chemical reactions under the ordinary conditions .
- 2- When an atom of chlorine ($_{17}\text{Cl}$) is joined with an atom of sodium ($_{11}\text{Na}$) , the product will be an ionic compound , but when two atoms of chlorine are joined together , the product will be a covalent molecule .
- 3- The bond in an oxygen molecule is a double covalent bond .
- 4- Acids change the colour of litmus paper into red .
- 5- Bases change the color of litmus paper into blue .
- 6- White clouds are formed when ammonia gas reacts with hydrochloric acid .
- 7- Chemical reactions play a vital role in our life .
- 8- Burning of coal and cellulose fibers has bad effects .
- 9- Carbon monoxide is a dangerous gas for human's health .
- 10- The car passengers are rushed forward when the car stopped suddenly .
- 11- Spare parts of cars are covered with grease .

- 12- Astronomers don't measure the distance between stars with kilometers .
- 13- The presence of life on the surface of Earth's planet only .
- 14- Earth gravity helps in continuity of life .
- 15- The crystals of the minerals forming the plutonic igneous rocks are large in size .

Question 5 : Give one difference between each of the following :

- 1- Acids and bases.
- 2- Light waves and sound waves.
- 3- Inner planets and outer planets.
- 4- Granite and limestone.

Question 6 : Correct the underlined words:

- 1- Oxides are substances that dissociate in water producing positive hydrogen ions.
- 2- Mass is an attraction amount of Earth to abody.
- 3- Electric generators (dynamo) convert the heat energy into electric one.
- 4- Inner core of the Earth is rich in iron and aluminum.
- 5- Granite is a sedimentary rock.
- 6- Earthquakes intensity is recorded by an apparatus known as barometer.

Question 7 : Give one example for each of the following :

- 1- Mechanical waves.
- 2- An apparatus, depends in its working on electromagnetic forces.
- 3- The igneous volcanic rock.

Question 8 : Choose the correct answer :

- 1- All of the following are metals except
(iron – oxygen – copper – sodium)
- 2- The chemical formula of sulphuric acid is
(HNO_3 – H_2SO_4 – HCl – H_2O)
- 3- The chemical formula of sodium hydroxide is
(Na_2CO_3 – NaOH – NaCl – HCl)
- 4- The chemical formula of carbonate group is
(HCO_3 – CO – CO_2 – $(\text{CO}_3)^{-2}$)
- 5- From applications on ultraviolet rays
(Photographing bones – night vision apparatus – sterilizing the sets of surgical operations rooms – discovering some swellings)
- 6- The biggest units of the universe are
(Planets – stars –galaxies – moons)
- 7- Planets revolve around the sun in paths.
(Circular – elliptical – spiral – irregular)
- 8- The nearest planet to the sun is
(Earth – Mars – Mercury – Venus)
- 9- A big volume planet , its density is low and consists of gaseous elements is.....
(Earth – Mercury – Jupiter – Venus)
- 10-The inner layer of the Earth is called
(crust – epidermis – mantle – core)
- 11-The inner core of the Earth is rich in
(iron and copper – iron and silver – iron and nickel – iron and aluminum)

12-Telescope is used in studying the.....

(intensity of earthquakes – minerals – volcanoes – celestial bodies)

13-All of the following parts of the volcano, except.....

(pipe- cone – volcanic vent – plateau)

Question 9 : Put (✓) in front of the correct statement and (X) in front of incorrect one and correct the wrong :-

- 1- When ammonia gas reacts with hydrochloric acid, white clouds is formed . ()
- 2- Sodium hydroxide changes the colour of the litmus paper into red. ()
- 3- The water bodies represent about 50% of the Earth's surface. ()
- 4- The Earth is the third planet according to the distance from the sun. ()
- 5- Earth is considered as the biggest mass in the inner planets of the solar system. ()
- 6- Inner core layer of the Earth is rich in iron and nickel. ()
- 7- Quartz mineral is a main compound in granite rock. ()
- 8- The earthquakes intensity are recorded by an apparatus known as seismograph. ()
- 9- The earthquake of intensity ranges from 3 to 4 Richter causing strong shakes that cause great losses . ()





Question 10 :

A-What do you expect in the following cases :-

- 1- Approaching a wet rod with hydrochloric acid to ammonia gas.
- 2- When an electric current passes through an insulated – copper wire coiling around a bar of soft iron .
- 3- Don't use the safety belts in cars.
- 4- Absence of ozone layer in the atmosphere.
- 5- There is no atmosphere.
- 6- We can't invent the telescope.

B- Compare between each of the following :-

- * Periodic motion and translational one , giving example for each of them.
- * Metals and non metals.

C- Explain with drawing the inner structure of the Earth .

Question 11 : Mention the chemical formula of the following compounds :-

- A- Hydrochloric acid
- B- Sulphuric acid
- C- Nitric acid
- D- Sodium hydroxide
- E- Calcium hydroxide
- F- Sodium oxide
- G- Sulphur trioxide
- H- Ammonium chloride
- I- Calcium sulphate
- J- Silver chloride



Question 12 : General questions :-

2- Mention one application for each of the following:-

- 1- Infrared rays
- 2- Ultraviolet rays
- 3- X-rays
- 4- Visible light
- 5- Gamma rays

3- Problem

Calculate the mass of an object weights 98 Newton (knowing the Earth's gravity = 9.8m/s^2)

Question 13 :

Choose from column (B) and (C) what is suitable for column (A):-

(A)	(B)	(C)
1- Comet	1- Sedimentary rock	1-In a vertical or horizontal direction.
2- Fault	2- Molten materials	2-To measure the universal distances.
3- Volcano	3- Fracture in the outer core	3-To permit the passage of lava and prisoned gases.
4- Galaxies	4- Fracture in the Earth's crust causes the sliding of rocks.	4-exits from volcanic vent.
5- Lava flows that	5- Unit that the universe is consisted of.	5-It is formed of the molten material after their solidification.
6- The cone	6- Opening in the Earth's crust.	6-The main component is quartz.
7- Sandstone	7- White pure metamorphic rock.	7-Its origin is from limestone.
8- Marble	8- Volcanic igneous rocks.	8-Tremendous collection of stars.
9- Basalt	9- It consists of yellow small granules from basic minerals.	9-Is formed of olivine , pyroxene and feldspar minerals.
	10-It rotates around the sun with in orbits intersecting with of the planet's orbits.	10-Is consisted of head and tail.
	11-Volcano's cone.	11-Its origin is from sediments.



Answer Q1

Model Answer

- 1- Oxygen - carbon
- 2- ionic bond - single covalent bond
- 3- positive hydrogen ion (H^+) - negative hydroxide ion (OH^-)
- 4- NH_4Cl
- 5- CO_2
- 6- H_2O - H_2SO_4
- 7- HCl - $NaOH$
- 8- Mechanical Waves - Electromagnetic waves
- 9- winches and electric bell
- 10- Ultraviolet
- 11- Mercury - Jupiter
- 12- Reflecting Telescope - Refracting Telescope
- 13- the mantle and the core
- 14- Ozone
- 15- 17 ملغي

Answer Q2

- 1- Positive ion
- 2- Negative ion
- 3- Triple covalent bond
- 4- Inert (Nobel) Gases
- 5- Valence
- 6- metals
- 7- Chemical Equation
- 8- Chemical Reaction
- 9- periodic motion
- 10- Transitional motion
- 11- Light Year

12- Planets

13- moons

14- meteorites

15- The Earth's crust

16- 19 ملف

Answer Q3

1- Positive ion: It is an atom of a metallic element that loses an electron or more during chemical reactions

2- The atomic group: it is a set of atoms of different elements joined together, behave like one atom during a chemical reaction, has its own valence and it is not existed solely.

3- Force: it is an effect that attempts to change the object's state from being static to motion or vice versa or attempts to change the direction of motion.

4- Inertia: It is the property of an object that has to resist the change of its state from rest to motion at regular speed in a straight line unless an external force acted on it

5- Meteorites: they are celestial bodies of huge solid rocky masses that don't burn up completely when they penetrate the atmosphere and fall on the earth's surface.

6- Comets: they are masses of rocks, ice and solidified gases that revolve around the Sun in more elongated elliptical orbits intersecting with the orbits of the planets.

7- Moons: They are bodies that are affected by the gravity of the larger planets and rotate around them.

8- Asteroids: They are rocky celestial bodies, that rotate around the Sun in the region of the belt of the wanderer asteroids.

9- Outer Planets: They are the farthest four planets from the sun in the solar system (Jupiter, Saturn, Uranus and Neptune).

10- Inner Planets: they are the nearest four planets from the Sun in the solar system (Mercury, Venus, Earth and Mars).

ملغى 11-12

Answer Q4

1- Because their outermost energy levels is completely filled with electrons.

2- Because sodium metal atom joins with chlorine nonmetal atom by losing one electrons from sodium to chlorine and ionic compound is formed, while chlorine atom joins with other chlorine atom by sharing with one electron for each atom to form covalent molecule.

3- Because it occurs by sharing each oxygen atom with two electrons to complete its outermost energy level with electrons.

4- Because acids dissociate in water producing positive hydrogen ion.

5- Because bases dissociate in water producing negative hydroxide ion.

6- Due to formation of ammonium chloride as white clouds



7- Because we use chemical reactions to:

a- Get electric and heat energies used in industries.

b- Get more useful substances from less used substances.

c- Prepare thousands of compounds used in many industries such as:

Medicines - Fertilizers - Fuel - Plastics - Food - Car batteries.

8- Because it causes air pollution and lung cancer.

9- Because it causes headache, fainting, severe stomach-aches and may lead to death.

10- Due to inertia, as they try to maintain their state of motion.

11- To decrease friction and prevent their erosion.

12- Because the distances between stars are too huge to be measured by kilometers.



13- Due to:

- a- The presence of hydrosphere
- b- The presence of atmospheric envelope containing oxygen gas needed for life.
- c- Its temperature is suitable during both day and night.
- d- Its atmospheric pressure and its gravitational force are suitable.

14- because Earth's gravity causes:

- a- Constancy and steadfastness of objects and living organisms on its surface.
- b- Steadfastness of the hydrosphere position on its surface.
- c- Keeping the Earth surrounded by the atmosphere.

15- ملغي

Answer Q5

1	Acids	Bases
Definitions	They are substances which dissociate in water producing positive hydrogen ions H^+	They are substances which dissociate in water producing negative hydroxide ion OH^-
Taste	They have sour taste	They have bitter taste
Effect on litmus paper	They change the colour of blue litmus paper into red	They change the colour of red litmus paper into blue
Examples	H_2SO_4 - HCl	$NaOH$ - $Ca(OH)_2$

2	Light Waves	Sound Waves
	Electromagnetic wave	Mechanical wave
	Don't need a medium to transfer through	Need a medium to transfer through
	Can transfer through space	Can't transfer through space
	Its speed is very high (300 milions m/s)	Its speed is relatively low (340 m/s)

3	The inner planets	The outer planets
Definition	They are the nearest four planets to the Sun	They are the farthest four planets from the Sun
Arrangement	Mercury - Venus - Earth - Mars	Jupiter - Saturn - Uranus - Neptune
Size	Small	Big

Answer Q6

- 1- Acids
- 2- Weight
- 3- Mechanical
- 4- Nickel
- 5- ملغي
- 6- ملغي

Answer Q7

- 1- Sound waves
- 2- Electromagnet
- 3- ملغي

Answer Q8

- 1- Oxygen
- 2- H_2SO_4
- 3- NaOH
- 4- $(CO_3)^-$
- 5- Sterilizing the set of the surgical operations room
- 6- Galaxies
- 7- Elliptical
- 8- Mercury
- 9- Jupiter
- 10- core
- 11- iron and nickel
- 12- Celestial bodies
- 13- ملغى

Answer Q9

- 1- (✓)
- 2- (X) Sodium hydroxide changes the colour of litmus paper into blue.
- 3- (X) Water bodies represent about 71% of the Earth's surface.
- 4- (✓)
- 5- (✓)
- 6- (✓)
- 7- ملغى 9

Answer Q10

A-

- 1- White clouds of ammonium chloride are formed $NH_3 + HCl \rightarrow NH_4Cl$
- 2- The iron bar will attract the iron fillings, because the iron bar is changed into a temporary magnet (electromagnet).
- 3- The driver may be injured on sudden stopping
- 4- The ultraviolet rays will reach the Earth's surface and harm living organisms.
- 5- There is no life due to absence of oxygen gas.
- 6- We can't discover the celestial bodies.



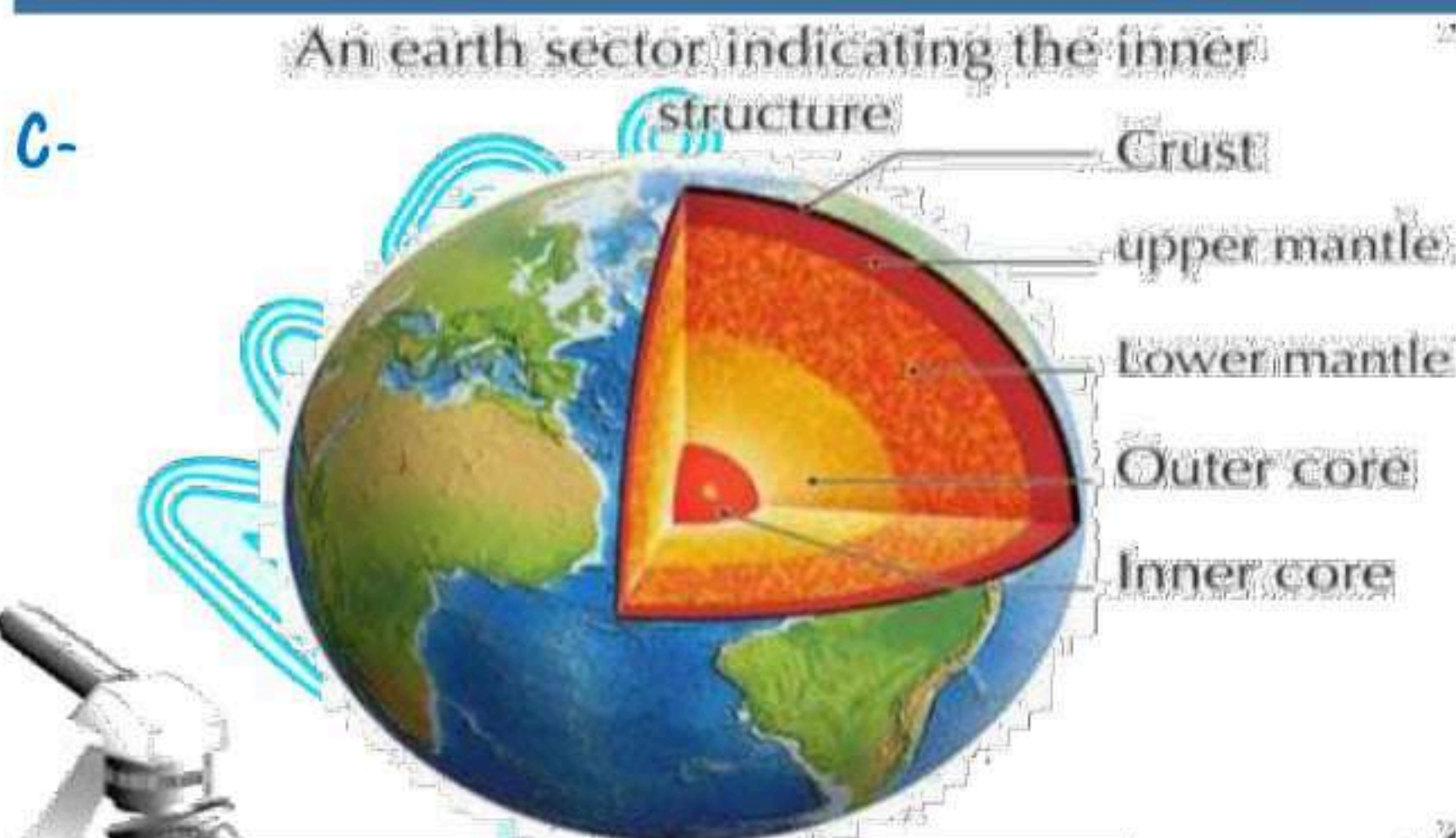
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B	Periodic Motion	Transitional Motion
	It is a motion which is regularly repeated in equal periods of time.	It is a motion in which the object's position is changed from time to time relative to a fixed point
	Examples: A Bicycle motion A train motion A car motion	A vibrating motion: As the motion of the simple pendulum A circular motion: As the motion of the fan arms A wave motion: As the motion of water waves

Metals	Nonmetals
1. They are solids [except mercury (Hg) which is a liquid].	1. They are solids and gases [except bromine (Br) which is a liquid].
2. They have metallic luster.	2. They have no luster.
3. They are malleable and ductile.	3. They are not malleable or ductile.
4. They are good conductors of heat and electricity.	4. They are bad conductors of heat and electricity [except graphite which is a good conductor of electricity].
5. They have less than (4) electrons in the outermost energy level.	5. They have more than (4) electrons in the outermost energy level.
6. During the chemical reaction, their atoms tend to lose an electron or more and change into positive ions.	6. During the chemical reaction, their atoms tend to gain an electron or more and change into negative ions.



Answer Q11

- A. HCl
- B. H_2SO_4
- C. HNO_3
- D. NaOH
- E. $Ca(OH)_2$
- F. Na_2O
- G. SO_3
- H. NH_4Cl
- I. $CaSO_4$
- J. AgCl

Answer Q12

1- ملغي

2- 1) Infrared rays → Night vision

2) Ultraviolet rays → Sterilize the set of surgical operations rooms.

3) X-rays → Photographing bones for detecting the sites of bone fractures

4) Visible light → Photographic Cameras

5) Gamma Rays → Treatment and discovering of some tumors.

3- Mass = Weight / Gravitational Acceleration = $98 / 9.8 = 10 \text{ Kg}$



Answer Q13

(A)	(B)	(C)
1- Comet 2- Fault 3- Volcano 4- Galaxies 5- Lava flows that 6- The cone 7- Sandstone 8- Marble 9- Basalt	1- Sedimentary rock 2- Molten materials 3- Fracture in the outer core 4- Fracture in the Earth's crust causes the sliding of rocks. 5- Unit that the universe is consisted of. 6- Opening in the Earth's crust. 7- White pure metamorphic rock. 8- Volcanic igneous rocks. 9- It consists of yellow small granules from basic minerals. 10- It rotates around the sun with in orbits intersecting with of the planet's orbits. 11- Volcano's cone.	1- In a vertical or horizontal direction. 2- To measure the universal distances. 3- To permit the passage of lava and prisoned gases. 4- exits from volcanic vent. 5- It is formed of the molten material after their solidification. 6- The main component is quartz. 7- Its origin is from limestone. 8- Tremendous collection of stars. 9- Is formed of olivine, pyroxene and feldspar minerals. 10- Is consisted of head and tail. 11- Its origin is from sediments.



Test 1

Question 1 : Complete the following statements:

- 1- The layer in the atmospheric air protects living organisms from the harmful rays .
- 2- From the sets which depend on electromagnetic forces to work is the
- 3- From the benefits of friction; it
- 4- Waves are divided into two types which are waves and waves .
- 5- Object's weight= Earth's gravity acceleration \times
- 6- Granite is from rocks but limestone is fromrocks .

Question 2 :

A- Define :

- 1- Earthquakes
- 2- Positive ion

B- Write the scientific term for the following sentences:

- 1- It is an atom lost one electron or more during the chemical reaction . ()
- 2- Breaking of the existing bonds in the reactant molecules and forming of new bonds in the products molecules . ()
- 3- Elements which are solids ,have luster and good conductors of heat and electricity. ()
- 4- A set of symbols and chemical formulae expressing the reactants and the products molecules in the chemical reaction.()
- 5- The amount of Earth's attraction to that object . ()
- 6- It is a property of an object to resist the change of its phase from rest to motion with a regular speed and in a straight line unless an external force acted upon it . ()



Question 3 : Give reasons for:

- 1- The car passengers are rushed forward when the car stopped suddenly.
- 2- Astronauts can't hear each other voices directly in space.
- 3- Astronomers don't measure the distance between stars with kilometers
- 4- The bond in an oxygen molecule is a double covalent bond .

Question 4 :

A- Choose the right answer :

- 1- Oxygen is from
(acids – bases – metallic elements – non metallic elements)
- 2- The chemical formula of sulphuric acid is
(H_2O – HCl – H_2SO_4 – HNO_3)
- 3- The telescope is an apparatus which is used in studying:
(earthquakes intensity - minerals - volcanoes - celestial bodies)
- 4-The idea of machine lubrication depends on the decreasing of the
(object's weight – inertia – friction forces – gravity)
- 5- Seismograph apparatus is used in recording the
(volcanoes – storms - earthquakes - celestial bodies)

B- Compare between:

- 1- Electric generator – Electric motor .
- 2- Bases (alkalis) – Acids .



Model Answer

Answer Q1

- 1- ozone
- 2- electric bell and winch
- 3- it prevent slipping of feet during walking
- 4- mechanical - electromagnetic
- 5- object's mass
- 6- ملغي

Answer Q2

- A- 1- ملغي
- 2- Positive ion: It is an atom of a metallic element that loses an electron or more during the chemical reaction.
- B- 1- Positive ion
- 2- Chemical reaction
- 3- Metals
- 4- Chemical equation
- 5- the object's weight
- 6- Inertia forces

Answer Q3

- 1- Due to inertia, as they try to maintain their state of motion
- 2- Because sound waves are mechanical waves that can't travel through space.
- 3- Because the distances between stars are too huge to be measured by kilometers.
- 4- Because each oxygen atom share the other with two electrons.

Answer Q4

A- 1- Non metallic elements

2- H_2SO_4

3- celestial bodies

4- friction forces

5- ملغي

B-

SAAR

1	Electric generator	Electric motor
	It changes mechanical energy into electric energy	It changes electric energy into mechanical energy
2	Acids	Bases
	They are substances which dissociate in water producing hydrogen ion H^+	They are substances which dissociate in water producing hydroxide ion OH^-
	They have sour taste	They have bitter taste
	They change the colour of blue litmus paper to red .	They change the colour of red litmus paper to blue.
	Ex: H_2SO_4 & HCl	Ex: $NaOH$ & $Ca(OH)_2$

SAAR

MR

Test 2

Question 1 : Complete the following statements:

- 1- Sedimentary rocks are formed as a result of the and.....
- 2- When bases dissolve in water, it produces negativeions.
- 3- Planets revolve around the sun inpaths, these paths lie in one planeto the sun's axis of rotation.
- 4- The weight of an object is measured byunit.
- 5- The distance covered by the light in one year is called

Question 2 :

(A) Define :-

- 1- Acids
- 2- The atomic group
- 3- Object's weight
- 4- Inertia

(B) Write the scientific term :-

- 1- The motion which is regularly repeated in equal periods of time .
- 2- The region which separates between the group of the inner planets from that of the outer planets.
- 3- Elements don't participate in chemical reactions under the ordinary condition due to the completeness of their outer most energy levels with electrons .

Question 3 :

(A) Compare between each of the following :

- 1- Positive ions and negative ions.
- 2- Ionic bond and covalent bond.

(B) Correct the underlined words:

- 1- Electric generator (dynamo) converts the heat energy into an electric one.
- 2- Inner core of the Earth is rich in iron and aluminum.
- 3- Salts are substances that dissociate in water producing negative hydroxide ions (OH)⁻.

Question 4 :

(A) Choose the correct answer between brackets :-

- 1- The chemical formula of sodium hydroxide is
(Na₂CO₃ – NaOH – NaCl- HCl)
- 2- The outer layer of the Earth is called
(crust – mantle – inner core – outer core)
- 3- Electromagnet is used in making
(calculator – electric bell – microscope – night vision apparatus)
- 4- Car brakes are one of the applications of
(gravitational force – friction force – nuclear force – inertia force)
- 5- Which of the following is considered as a circular motion ?
.....
(fan motion – pendulum motion – train motion – sunflower plant motion)
- 6- Which of the following isn't considered as electro magnetic waves.....?
(infrared rays – visible light – sound waves – ultraviolet rays)

(B) Give reasons for:-

- 1- An object's weight is changed from a planet to another.
- 2- An effervescence takes place when hydrochloric acid is added to a sample of limestone



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Model Answer

Answer Q1

- 1- ملغي
- 2- hydroxide
- 3- elliptical – perpendicular
- 4- newton
- 5- light year

Answer Q2 A-

- 1- Acids: They are substances which dissociate in water producing positive hydrogen ion H^+
- 2- Atomic group: It is the set of atoms of different elements joined together, behave like one atom during a chemical reaction, has its own valency and it is not existed solely.
- 3- Object's weight: It is the ability of the Earth to attract that object to its centre.
- 4- Inertia: It is a property of an object that has to resist the change of its state from rest to motion at a regular speed in a straight line unless an external force acted on it.

B-

- 1- Periodic motion
- 2- The belt of wanderer asteroids
- 3- Inert (Nobel) gases

Answer Q3

Positive ion	Negative ion
<ol style="list-style-type: none"> 1. It is an atom of a metallic element that loses an electron or more during the chemical reaction. 2. It carries a number of positive charges equals to the number of the lost electrons. 3. The number of its electrons is less than the number of protons inside the nucleus. 4. The number of its energy levels is less than that of its atom. 	<ol style="list-style-type: none"> 1. It is an atom of a nonmetallic element that gains an electron or more during the chemical reaction. 2. It carries a number of negative charges equals to the number of the gained electrons. 3. The number of its electrons is more than the number of protons inside the nucleus. 4. The number of its energy levels is equal to that of its atom.
Ionic bond	Covalent bond
<ol style="list-style-type: none"> 1. It arises between metal and nonmetal elements. 2. It is formed by losing and gaining of electrons. 3. It is formed between two atoms of two different elements. 4. It is formed due to the electrical attraction between the positive and negative ions. 5. It has one type. 6. It produces compounds molecules only. 	<ol style="list-style-type: none"> 1. It arises between two nonmetal elements. 2. It is formed by sharing of one pair of electrons or more. 3. It may be formed between two atoms of the same or different elements. 4. It is formed due to sharing of electrons between the atoms. 5. It has three types (single, double and triple). 6. It produces elements and compounds molecules.

B- 1- mechanical

2- ملفي

3- Bases

Answer Q4

A- 1- NaOH

2- Nickel

3- electric bell

4- friction force.

5- fan motion

6- Sound waves

B- 1- Due to the difference in the gravitational accelerations of the planets

2- ملفي